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AMIGA SHOPPER

The top-selling serious Amiga magazine

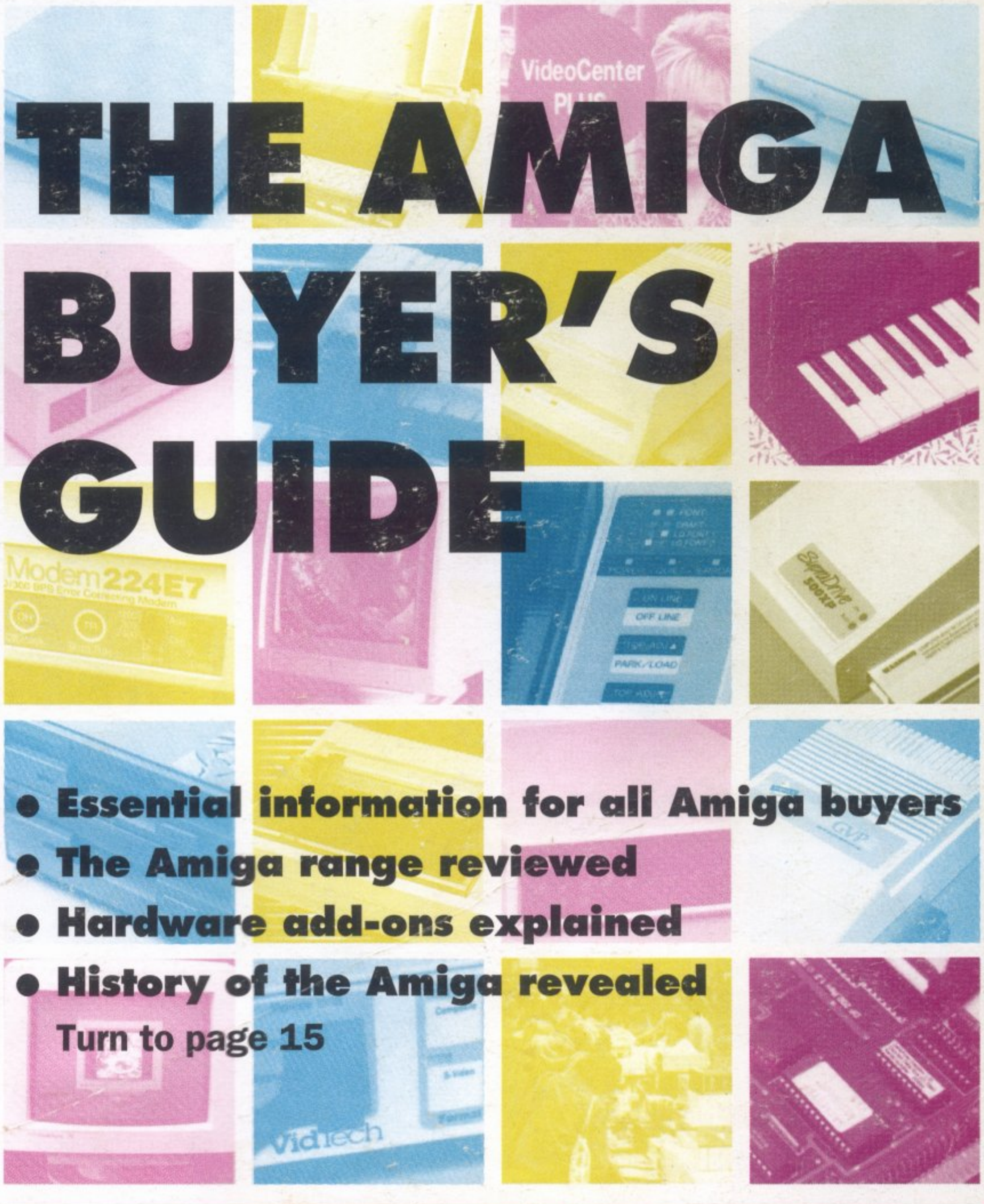
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HAM-E: HYPE OR HIT?

You've read the previews, now find out just how this advanced graphics system really stands up to the most exacting tests – page 32



THE AMIGA BUYER'S GUIDE

- Essential information for all Amiga buyers
- The Amiga range reviewed
- Hardware add-ons explained
- History of the Amiga revealed

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AMIGA ANSWERS

Readers' real life problems solved by our panel of experts - pages 41-71

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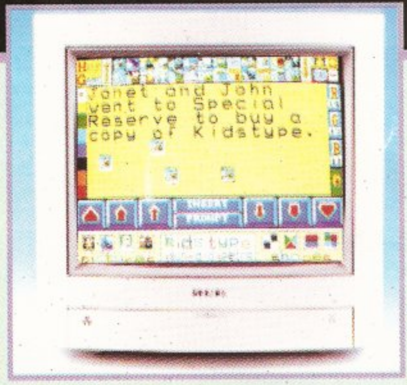
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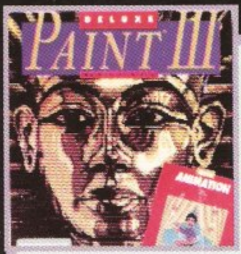
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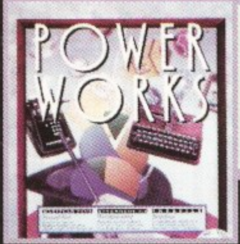
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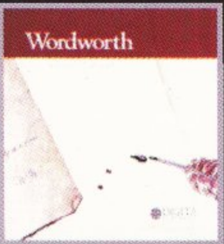
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WELCOME

AMIGA SHOPPER AT A GLANCE GUIDE

To help you find what you want quickly and easily, this is a cross-referenced list of all the products and subjects covered in this month's *Amiga Shopper*. The subjects covered in Amiga Answers are detailed on page 49; the many PD programs covered on page 140 are listed there. The page numbers given are for the first page of the article in which the product is mentioned.

Big or what! Regular readers will have noticed already that *Amiga Shopper* is thicker than ever – no less than 172 pages for a piddling 99p. That's good value, even if I do say so myself; is a cover disk really worth the extra two quid? Anyway, that's enough trumpet blowing, what's in store this month...

Our main feature this month takes a thorough look at the Amiga range and all the hardware add-ons you can buy for it. If you're considering buying an Amiga, this is the place to start. If you already have one then look on it as a number of suggestions for where you might want to take your computing. And next month we'll cap it off with a round up of the software that's available.

Our main review is of the amazing HAM-E system. This remarkable box gives you instant access to 300,000 colours from a range of 16.7 million. It makes a 32-colour screen look a bit sick. Our graphics experts Gary Whiteley and Phil South have put the device through its paces and we are proud to present the most exacting review of HAM-E ever published.

STOP PRESS

As we were going to press details were emerging of a new, redesigned Amiga 500 actually being sold in shops around the country. It seems that the new machines have features previously only seen in the up-market A3000, but they are appearing in some Cartoon Classics bundles.

More details on page 7.

PUBLIC DOMAIN WORLD

There are thousands of Amiga programs which are available for little more than the price of a disk. And many more which allow you to try the software free before you buy. Each month in Public Domain World we examine the best of these programs and explain how to get hold of them.

This month PD expert Phil South reviews a batch of utilities disks. There a dozens of PD utilities which no Amiga owner can afford to be without. Virus killers, disk utilities, programming aids, file archivers and many others. Find out which disk offers the best selection. Plus graphics, music, demos...

ENTER THE PD WORLD ON PAGE 154

AMIGA ANSWERS

SIXTEEN PAGES DEVOTED EXCLUSIVELY TO ANSWERING YOUR QUESTIONS

Every month in Amiga Answers our panel of experts answer more genuine reader questions than any other Amiga magazine. And for beginners our starter page will help you get to grips with your Amiga, and understand the other features in this month's issue.

We answer questions every month on Workbench • The CLI • Comms • Programming • DTP • Video • Business software and more.

THE ANSWERS START ON PAGE 41
BEGINNERS TURN TO PAGE 69

FOR A FULL LIST OF CONTENTS, TURN THE PAGE

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'Super A500' sneaks in before Christmas

THEY CAME ON us unawares – in the dead of night the new Amiga 500 Pluses sneaked into shops across the country. Despite the new machine's much improved specification, it made its appearance in an ordinary Cartoon Classics box, without any announcement by Commodore.

The A500 Plus comes with the long-awaited Kickstart 2.04, Workbench 2.0 and the Enhanced Chip Set, as used in the Amiga 3000. It also has 1Mb of memory onboard. Workbench 2.0 provides a much more attractive and logical user-interface, based around a grey colour scheme with a pseudo three-dimensional look to windows and gadgets.

The changes are more than cosmetic, though. With the aid of the Enhanced Chip Set, Workbench now provides a number of additional screen modes: SuperHires with a resolution of 1280x256 (or 512 with interlace); Productivity, which requires a multiscan monitor and gives a resolution of 640x480 or 640x960; and A2024, which gives a resolution of 1008x800 and requires a Commodore A2024 monitor.

The preferences section of Workbench has been greatly expanded to give the user control over these and other options. For instance, it is possible to define a background pattern to be displayed on the Workbench screen or on every window opened. The number of colours displayed on-screen can be determined, up to a maximum of sixteen, and the level of overscan can be user-defined to take up unused portions of a monitor's display. A Workbench screen can be defined to be much larger than the visible display area. For instance, the Hires screen can have a maximum size of 16368x16384, with the invisible portions being scrolled into view as the mouse pointer is moved to the edge of the screen.

The standard Workbench menus have also been enhanced, providing a greater range of options. These include the ability to execute a Shell command from Workbench, the ability to create a new drawer, and the ability to show as icons files that have no corresponding info files. Most menu options now have corresponding keyboard short cuts.

Input control is further extended by the addition of a set of 'Commodities



New logo: the only change visible from the outside, but...

Exchange' programs. These intercept user input before sending it on to Intuition, and provide facilities such as screen blanking, turning off the caps lock key, bringing to front whichever window is beneath the mouse pointer, and assigning text to the function keys.

Compugraphic fonts are supported, and can be used on the Workbench screen. These are outline fonts, meaning that, unlike the situation with the Amiga's standard bitmap fonts, text of any size can be generated via a mathematical formula operating on a single font definition.

Beneath Workbench's charismatic exterior lies a completely rewritten Intuition, the graphical interface, and AmigaDOS. The latter was originally written in BCPL, but has now been re-coded from scratch in C for speed. A number of AmigaDOS commands have been improved and debugged in the process; many are now held internally on ROM and do not have to be loaded from the Workbench disk. Several new commands are also supplied.

Using the Shell is now a much more agreeable affair. For one thing, it supports cut and paste, so that it is possible to use the mouse to highlight text in one window and transfer it to another. The standard editor, Ed, also supports mouse operations. Customisation of startup-sequences is made safer by the inclusion of a user-startup file.

The machine itself, externally, looks the same as the good old A500. The only differences are a 'Plus' badge and two extra keys that can be used by foreign keymaps. Inside, however, the board has been completely redesigned. For one thing, a battery backed-up clock is fitted as standard. The Kickstart ROM, at 512K, is twice the size of previous ROMs. There is also a new Denise custom chip which supplies the extra graphics modes, and the Super Fat Agnus. This supports up to 2Mb of Chip RAM, meaning that stunning graphical effects are now possible. Although 1Mb of RAM is standard, the old A501 RAM expansion can still be fitted to the trapdoor, giving 1.5Mb of Chip RAM. A new expansion is to be released, giving an additional 1Mb of Chip RAM.

All in all, the A500 Plus is a great step forward for the Amiga. A much more powerful system has been made available for the same price, and this must be good news.

If it's so good, why the big secret?

THE RELEASE OF the A500 Plus is the biggest and most eagerly awaited Amiga upgrade since its launch, so why did Commodore make no official announcement? The new machine was scheduled for launch in January but, according to Commodore, the demand for Amigas in the run up to Christmas has been so high that the company has been forced to make up its supply shortfall with the newer models.

The situation at the moment is that Commodore cannot be certain whether it will be supplying A500s or A500Ps. The company claims that anywhere between two and four thousand new models have been released, whereas individual distributors are each claiming they have stocks of several thousand. Commodore's main worry is that once the public learns about the new model demand for the old is going to drop like a stone.

The question of compatibility complicates the issue still further. Commodore has tested 900 titles and found all but 12 of them to work on the new model without problems. The remaining 12 are all games. However, many dealers claim to have found the number of misbehaving games and PD programs to be much higher.

In Brief

COMMODORE MOVES IN ON MULTIMEDIA

Commodore has set up a multimedia division to promote the Amiga in this burgeoning market.

Innovation seems certain in the multimedia market with Commodore devoting itself to this latest in a series of forward-looking developments. This year has seen a world-first in the form of the CDTV, the announcement of a multimedia centres network across the country and not long ago Commodore's deal with P&P, the leading independent micro computer supplier, for corporate sales of all things Amiga.

According to Barry Thurston, new director of the multimedia division, "Multimedia is no longer future technology, it is here now and it is based on the Amiga." Establishing a separate division symbolises the company's bid to lead the field in multimedia.

NEW HORIZONS, NEW RELEASES

New releases and upgrades are on the agenda for New Horizon. To start with, *Flow* has at last been upgraded. The new version, *Flow* 3.0 (£69.95 inc VAT) comes with various enhancements which have been suggested by existing users. The 'idea organizer' has many improved features, enabling much more to be done with documents. An upgrade to *ProWrite* is also imminent. *ProWrite* 3.2 (no UK prices available yet) now comes with PostScript output, taking the software's capabilities further. Last but not least is *Designworks* (£69.95), the company's new drawing program, which is claimed to be "fast, intuitive and affordable." For information contact SDL on ☎ 081-309 1111.

Commodore gets into the groove

IN A BID to enhance the Amiga's musical standing, Commodore UK is to sponsor the London Philharmonic orchestra to the tune of £120,000. The company's corporate muscles are also being flexed in an on-going sponsorship deal with Chelsea Football club. Said Stephen Franklin, Commodore's managing director: "We are committed to harnessing computer technology to all facets of life – from sport to music." Exactly what Amigas have to do with football or orchestral music remains a mystery.

Back on the road again

MAP READING IS the source of many an argument, but with *GBRoute Plus* this could all be a thing of the past.

GBRoute Plus from Complex Computers is designed to help anyone from daytrippers to travelling salesmen find their way across the United Kingdom. Features of the software include over 25 million routes, with options enabling you to avoid specific roads and places. You can even plan your coffee-breaks with the motorway service stations option. It's all as easy as that really; you pick your route and you print it out.

GBRoute Plus costs £79.95 from Complex Computers ☎ 0706 224531



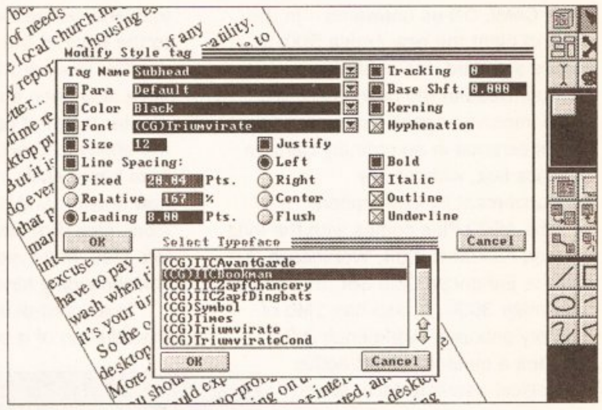
GBRoute Plus: new and improved.

Professional Page turned

by Jeff Walker

AN UPGRADED *Professional Page*, version 2.1 has been announced by Gold Disk.

Apart from some bug fixes and an increase in the screen refresh rate, there are a couple of major additions to the new version. The first will have all dot-matrix printer owners jumping for joy, because 2.1 will allow you to print sideways, or 'landscape' to give its correct technical term. The second addition is on-line help, making some of the more complex areas of the program less daunting to the aspiring desktop publisher.



***Professional Page*: a brand new set of features.**

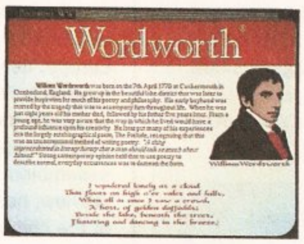
The new version is available directly from Gold Disk (☎ 010 1 416 602 4000) or from UK distributors, HB Marketing (☎ 0753 686000) for £254.98. An upgrade deal for existing owners has yet to be finalised. Look out for a full review soon.

Wordworth

a writer's dream v1·1

The graphical nature of Wordworth® makes producing documents faster and easier. The WYSIWYG display shows exactly how your printed document will look, different fonts, styles and sizes, headers and footers, graphics and so on.

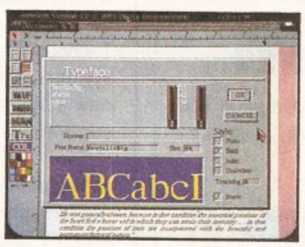
Commands are grouped under a series of pull-down menus, accessible either by the mouse or keyboard. Frequently used commands have on-screen icons, including Help, should you need it.



Experience the look and feel of the new and exciting WB2 (even if you use WB1.3). Each document is a separate multi-tasking window, which means you could for example, print one document while editing another.

Digita's® innovative *Human Interface Protocol*™ is incorporated setting a new standard in speed, style and elegance. "It *HIP*™ system is intuitive and a pleasure to use." – thank you Amiga Shopper, it's nice to be appreciated.

Graphics have always been the Amiga's strong point. Now it's better than ever. Pictures from Deluxe Paint can be placed in a document, and then sized, scaled and dragged (text automatically reformats around the image).



Wordworth's enhanced fonts will give you the very best printed quality. You can also print special symbols, such as boxes, arrows and so on. Better still, you can mix graphics, Wordworth's enhanced fonts, Amiga fonts, Colorfonts and your printer's own internal fonts, all on the same page. There's even a driver for Postscript printers.

You needn't worry about your existing information – Wordworth will let you open documents from most word processors, including Kindwords, Protext and Wordperfect (you can also mailmerge with Superbase).

When Amiga Format said "a new word processor that will give the rest of the world a run for its money" they weren't joking.

Wordworth is written in the UK by Digita. Which means you'll be using an English Collins spelling checker and thesaurus, and you'll know where to come for professional support.

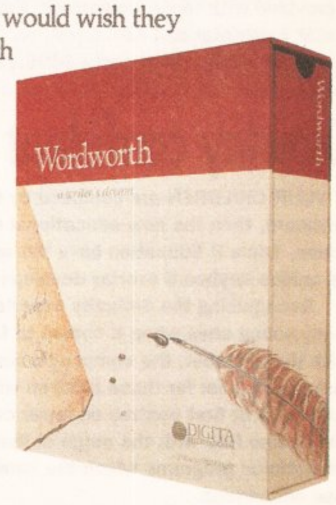


The only way to really appreciate Wordworth is to use it. Phone 0395 270273 for more information or, write to Digita, FREEPOST, Exmouth EX8 2YZ.

Wordworth costs £129.99, which includes VAT, postage and packing; and when purchased from Digita, comes with a 7 day money-back guarantee.

If you already own a word processor, for a limited period only, you can trade-up for just £89.99 by returning your original disks to Digita with your order.

Summing up, Amiga Shopper said: "Pounds-per-feature no other Amiga word processor comes close. Wordworth is what every owner of Kindwords would wish they had." Dreams become reality with Wordworth.



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KCS Powers in to the 3000

by Mark Smiddy

KCS'S POWER PC board, which offered Amiga 500 owners a fully specified CGA XT clone, has now been made available for the other models in the Amiga range. For an additional £65, users get an interface card which allows the Powerboard to drop into one of the existing slots on the 2000 and 3000 motherboard.

Previously, A2000 owners had the choice of Commodore's awful XT and AT Bridgecards or the Vortex AT-Once; and A3000 owners couldn't use any because of the faster 68030 processor. KCS claim this latest update is compatible with all machines, with any processor running at any speed. Moreover, faster machines benefit from the vastly improved frame rate in all modes.

Other news is that the company plan to release version 3 of the support software at the World of Commodore show in November. This adds support for 16-colour EGA graphics, autoboot from hard disk and unconfirmed support for extended/ expanded memory. *(Editorial note: the Powerboard is not compatible with all hard disk controllers.)* Expect a review of this soon.

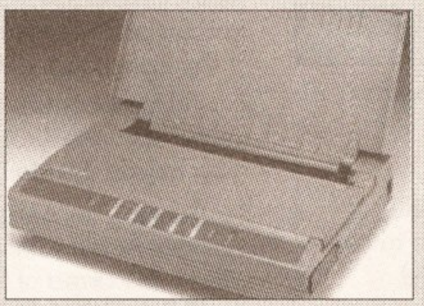
Jet setting

STAR MICRONICS, THE luminary of the printer world, has launched a bubble jet printer. The company's printers are already enormously successful in the Amiga world; this addition to the range will give users requiring better than dot-matrix quality an alternative to those produced by Canon.

The StarJet SJ-48 prints at 100 characters per second in two modes, letter and near letter quality. The latter doubles the life of the cartridge, which is good for 700,000 characters in letter quality mode. Two fonts are available, Roman and F-Gothic, in 6 and 12 point. Compatability is provided with three emulations: Epson LQ, IBM ProPrinter and NEC Graphics.

The printer itself costs £405.38.

Optional extras include a 30-page sheet feeder (£63.45) and a Ni-Cad battery (£45.83). Replacement cartridges, which also include fresh print heads, cost £21.09. Star Micronics can be contacted on ☎ 0494 471111.



Inkjet technology from a familiar name.

Overlay confident

IF YOUR CHILDREN are confused by the keyboard, then the new educational software house, Triple R Education have the answer with its unique keyboard overlay development.

Recognising the difficulty experienced by many young ones when it comes to familiarity with the alphabet, the company's new overlays make life easier for those children whose education at first centres on lower case letters. They come free with the range of five educational programs which the company has also announced.

The overlays are simple to take on and off, changing keyboard from upper to lower case and give options of QWERTY or alphabetical layout. There is even a variation which features coins to enable children to learn about money without getting their sticky fingers on the real thing.

So educational difficulties are minimised with one simple idea. Triple R's range includes *Dataword, Picture Book, Money Matters, Target Maths* and *Converta-Key* and comes in a range of formats. ☎ 061-442 8302.

DIARY DATES

November 10: All Formats Computer Fair. National Motorcycle Museum, Solihull. ☎ 0225 868100.

November 15-17: Amiga Format presents The World Of Commodore. Earls Court 2, London. Details on page 11.

December 1: All Formats Computer Fair. City Hall, Candleriggs, Glasgow. ☎ 0225 868100.

December 5-8: Computer Shopper Show. Wembley Exhibition Halls, London. Cape Cowley Associates ☎ 061 480 9811.

December 14: All Formats Computer Fair. Royal Horticultural Hall, London. ☎ 0225 868100.

December 15: All Formats Computer Fair. University Sports Centre, Leeds. ☎ 0225 868100.

The World of Commodore is c

Biggest descend

On Friday November 15th the biggest Amiga show ever held in Britain will open at Earls Court 2. The World of Commodore Show, which runs until Sunday 17th, is jointly hosted by Commodore UK and *Amiga Shopper*'s sister magazine *Amiga Format*.

The show will feature exhibitors from the USA and Europe, as well as the biggest collection of UK software and hardware manufacturers ever assembled. By way of a preview, here are just some of the companies that will be there offering bargains and showing off their latest kit. The numbers in brackets are the stand numbers. Full details of all the stands at the show will be given in the free colour show guide given away when you get to Earls Court.

- **New Dimensions** (A5) will be showing off its Technosound Turbo sound sampler. Also, look out for a new 12-bit sampler, currently under development

- **Microdeal** (F6) is also showing samplers, with AMAS 2 and Stereo Master prominent. On a more down to earth level, it will be showing *Personal Finance Manager 2.*

- **Bitcon** (A3) will have its KCS Powerboard PC emulator on show, demonstrating its capabilities and the range of IBM programs it will run.

- **HB Marketing** (A9) is one of the UK's leading distrubutors, and will have a huge range of products on its stand. In pride of place will be a remarkable new touch screen which does away with the mouse – just point at the screen!

- **Europress Software** (A20) will have *Fun School 4*, the latest version of its highly-successful educational program. And the AMOS compiler and AMOS 3D will be on show.

- **Precision** (B12) will doubtless be showing off *Superbase Professional 4* – the most powerful Amiga database available.

- **Cortex** (C20), the memory people, are set to launch a range of new RAM expansions – and look out for the prices.

- **DTBS** (A15) will be selling a range of books, including the very latest ROM Kernel manuals.

- **RGB Studios** (D12) will feature a new set of *Real Things* animations, including turtle, dolphins and other marine life.

- **Rombo** (B16) will be digitising everything in sight with the Complete Colour Solution, and its up-market video products.

- **HiSoft** (E16a) should be a port of call for programmers with *DevPac* 3, and with any luck its new version of Pascal too.

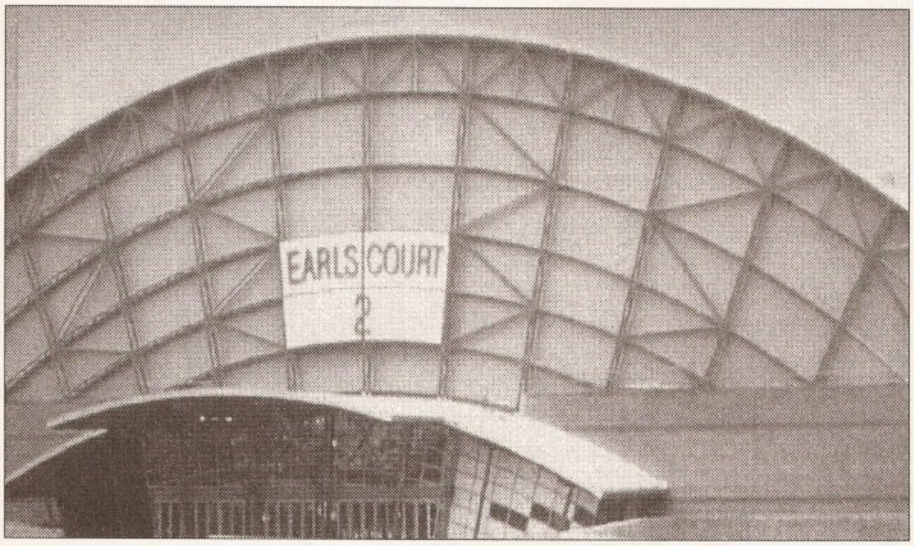
- **Mindscape** (E4) will be attracting budding musicians with its unique piano tutor system featuring a keyboard attached to an Amiga.

- **Digita** (E16c) will be attracting plenty of attention with the acclaimed *Wordworth* word processor, as well as it's extensive range of other products.

g to town on November 15-17. Will you be there for the show of the year?

ever Amiga show on London

WORLD OF COMMODORE PREVIEW



The vast Earls Court 2 complex has never been used for a consumer show before.

• **Zone Distribution** (D11a) will be sharing a stand with synth manufacturer Roland, and will have the full DrT's software range on show.

• **Checkmate** (G2) will be showing off its HAM-E system, which gives 24-bit colour without the price. Also on display will be American paint packages adapted for the colour board.

• ***Amiga World*** (E16b), the popular American magazine, will be sending a delegation, so you will have a chance to talk to the journalists face-to-face.

• **Electronic Arts** (C2), as well as showing off lots of those games thingies, will be demonstrating the awesome *Deluxe Paint IV*.

• **ICPUG** (A30), the Independent Commodore Products User Group, will be there to offer advice to all who need it.

• ***Just Amiga Monthly*** (A1) has a stand, manned by our contributing editor Jeff Walker, who will no doubt be interested in selling you a magazine.

• **Computer Manuals** (C22) will certainly be worth a call for anyone wishing to improve their technical library.

• **Pandaal** (E16d) will be providing a plethora of peripherals, from mice to hand scanners.

• **Power Computing** (G4) will be there with a whole range of hardware; disk drives, accelerator cards, memory expansions – you name it!

• **RGB Studios** (D12) will make an excellent stop for the sensitive artistic types. The company will be exhibiting two new series of clip art: survival and marine life.

• **Silica Systems** (D10), one of the largest UK distributors, will be there to air its wares.

• **Siren Software** (C28) will be showing the new Amiga Personal Sound System, which enables you to listen to your Amiga through headphones. The latest version of *X-Backup Professional* will also be in evidence, as will a number of disk drives.

• **WTS** (F14), hardware purveyors and distributors for Supra, will be there with a load of modems, memory expansions and so on.

• **Syntronix** (F25) will be demonstrating Editman, the Amiga video editing system.

• **Videk** (E18) will be there to fulfill just about any cabling requirement you can imagine.

• **Great Valley Products** (F8), Amiga hardware manufacturers par excellence, will be showing its latest version of the Impact Series 2 hard drive range, along with the Professional Video Adaptor, which provides a 24-bit framebuffer, a genlock and a Time Base Correction unit.

• **Supra Corporation** (F4) makes exceedingly good hardware. Check out the company's hard drives, modems and memory expansion units.

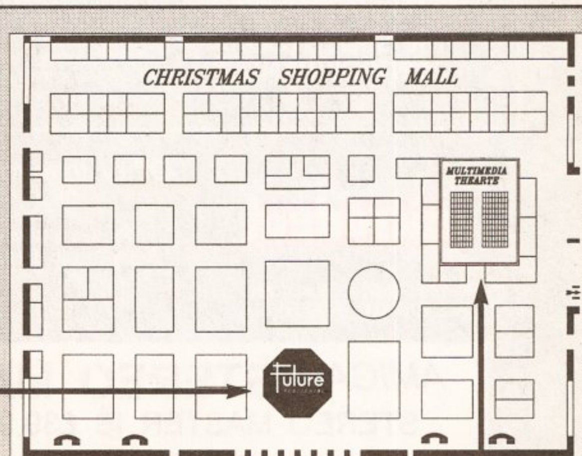
• **Sunrize Industries** (F16) will be showing its new AD1012 digital audio card. This samples at 12 bits and records direct to a hard disk. It's possibly the most exciting product on any home computer.

• **New Horizons** (G14), who recently took over Central Coast Software, will be exhibiting its range of software products, including *ProWrite, Flow, Designworks* and *QuickWrite*.

This is just the list as we have it a month before the show – many more dealers and manufacturers are expected to turn up. And that's before we start talking about the games makers!

The show is open between 9am and 6pm on Friday and Saturday, and 9am and 4pm on Sunday. Admission is £4.95, £2.95 for under-14s. Details of getting to the show are on page 102. We look forward to seeing you there! **AS**

WHERE TO FIND AMIGA SHOPPER IN EARLS COURT



The *Amiga Shopper* stand. Here you will find AmigaDOS expert Mark Smiddy, Deputy Editor Cliff Ramshaw and Andy Storer, who will have taken over the editor's chair by the show. There will be regular Q&A sessions – check the stand noticeboard for details.

The Multimedia Theatre. Among many events taking place here will be daily "meet the editors" sessions, where you can quiz the editors of *Amiga Shopper, Amiga Format* and *Amiga Power*, and put forward your suggestions for the magazine.

stereo MASTER

When you are considering purchasing a sound sampler there are plenty to choose from. Why compromise? your choice should be the new full featured STEREO MASTER for the Amiga, with software that is designed from our top selling Amiga sampler AMAS and a package that gives you more extras than a M series BMW. By purchasing this state of the art product which combines a quality sampler with the expertise of over 10 years of software programming, you are purchasing a top quality product with the knowledge that it is not only compatible with existing Microdeal products but will also be with future ones.

What is Stereo Master

Stereo Master is a low cost, high quality sound sampler for the Amiga range of computers. The sampler cartridge included in this package plugs into the printer port at the rear of the computer and allows you to analyze the sounds coming in from devices such as Personal Cassette Players, Compact Disc Players etc, or change the way they sound using the Real Time Special Effects or record them. Once in the computer STEREO MASTERS unique editor will enable you to edit the sound in practically any way you can imagine. Once you have the sound sample how you want it, you may incorporate it into your own Demo's or use STEREO MASTERS own built in sample sequencer to play back the sample in sequence with other samples!

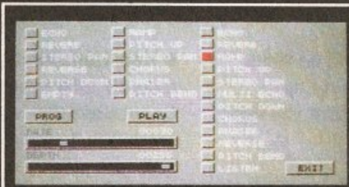


MAIN SCREEN

The Sampling Software

Every feature you would expect to find in a professional editing suite including;

- Real time record/play ghost markers
- Cut or Delete selected sample area
- Mix sample with full or half volume
- Shrink in by 25%/50%/75% by drag or wipe
- Fade in/out with selectable degree of fade
- Filter sample with soft/medium/hard filter
- Selectable trigger volumes
- Record frequency from 3.0 to 55.9 Khz
- Full editing and control facility for left/right channels
- Playback volumes
- Decrease volume
- Increase volume
- Bounce sample
- Paste sample
- Trigger recording
- Clear left/right samples
- Loop sample

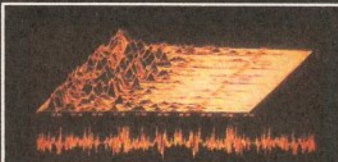


THE SPECIAL EFFECTS CONTROL PANEL

The Special Effects Software

For the first time ever you can emulate special sound effects in real time just like the sound labs can for film studios, normally the hardware to produce these effects would cost 100's of times more than this package. Features on the FX menu include;

- Built in real time special effects including Echo, Reverb, Ramp, Pitch up/down, Stereo bounce, Multi echo Chorus, Phaser, Reverse and Pitch bend.
- Fully programmable special effects so that customised effects can be recalled

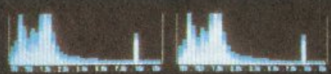


3D DISPLAY OF SAMPLE FREQUENCIES (FFT)

The Analytical Software

A whole host of pro-type analytical functions include;

- 3D display of sample frequencies (Fast fourier transform)
- 3D display also includes 2D envelope display plus sample information.
- Built in Stereo spectrum analyzer
- Stereo Oscilloscopes with trigger markers



STEREO SPECTRUM ANALYZERS



STEREO OSCILLOSCOPES



THE SEQUENCER CONTROL PANEL

The Sequencing Software

Our built in sample sequencer allows you to take up to 18 samples (memory permitting) and sequence them into your own "tronic" mixes, features on the sequencer include;

- Real time entry of sequences from keypad
- Step time entry of sequences
- 2 stereo channels for sequencing
- Storyboard style editing
- Digital sequence position display
- Fast forward/rewind controls
- Program sample to keypad
- Stand alone demo player displays IFF picture whilst playing sequence
- Sequence copy function
- Loop sample
- Selectable sequence speed
- Dump/re-edit function
- Test function
- 2 octave playback
- Insert/delete sample in step time

microdeal

Other innovative features

We know this product is years ahead of its time and these additional features justify our boast;

- New style stereo cartridge
- Produces stand alone executable sample files
- Fully multi tasking
- Saves in IFF/Raw/Instrument1/3/5 Octave
- Includes walkman type cable
- PAL/NTSC full screen display
- Can create workbench icons
- Save customised settings

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Talking Shop

This is where our readers speak their minds. And since our readers are the most intelligent of any Amiga magazine (if we do say so ourselves), this is the place to be read. Join your host, the editor Stuart Anderton...



MIND YOUR LANGUAGE

Whilst welcoming reviews of equipment that have an obvious benefit for disabled people, I really must complain about the terminology used by Pat Winstanley (*Amiga Shopper* 7).

Please do not refer to disabled people as "physically handicapped", this is now an obsolete term, and a most patronising and degrading one at that. The preferred reference would be either 'disabled people' or 'people with disabilities'.

I would gladly supply information on the subject of preferred terminology when dealing with this subject, and as the Amiga "expert" and Membership Sec of the British Computer Society Disability Programme, happily offer any advice I can when dealing with an article relating to disability.

I hope you appreciate that although this may seem a very minor complaint from your point of view, it is one that is vital to the disabled movement if disabled people are to get recognition as valid members of society.

Dave Winder
Sent via CIX

This one slipped through the net I'm afraid. We are aware of the sensitive issue of terminology, and both myself and Pat apologise for any offence caused.

ADVANCED BOOKING

The C programming series was excellent. For those looking for further reading I can thoroughly recommend *C: Step by Step* by Mitchell Waite and Stephen Prata, (Howard Sams). For those on a tight budget, *Learning to Program in C* by A Kantaris, (Babani Press) is a good little book to get you started and only a fiver from Maplin. As for those who bow to other gods, ignore them! Does not the Good Book say "The Heavens declare his righteousness, the people C his glory."

Mike Lundberg
Maud
Aberdeenshire

Other readers with awful C puns are invited to send them to any other magazine but *Amiga Shopper*.

I SHOT THE SERIF

I have received the October copy of *Amiga Shopper* and I am pleased that you have made some attempt to make the magazine more readable, although I do not understand your decision to go to a sans-serif font. It is generally accepted that a serif font is more easy to read and your consultant editor, Jeff Walker, has said so in his own magazine.

M A Kirk
Geneva
Switzerland

Sans-serif fonts (typefaces without the little flourishes at the ends of the letters) are indeed more legible, but unfortunately that isn't the only consideration we had to take into account. Serifed faces take up more room on the page, so you would get fewer words per article. We did change the font from Futura Book, one of the least legible sans-serif fonts, to Franklin Gothic Book. I hope we've got the balance about right.

TRASH WORKBENCH

When I first bought an Amiga I was stunned by the Workbench environment. It seemed wonderfully easy to use, my previous experience of computers being a Spectrum and then an Atari 800. After a few months I began to feel frustrated with the time taken to load icon data from the floppy drive, so after a trip to one of the shows I rushed home with the newly-released A590, an extra 1Mb of memory and a £500 hole in my pocket. Another amazing transformation, icons appeared in seconds instead of hours! But a few months later the frustration returned. The time taken for the icons to appear was again annoying me. I tried increasing the buffers, and only having to read the icon data once from disk was a marginal improvement, but a lot of memory was eaten by this solution.

Finally, I had the idea of trying to run programs in a similar manner to the way I use at work – I am an Operations Technician using a Wang VS minicomputer. We have menus set up which need only the pressing of a function key to run a program or reveal a new sub-menu, and it is a quick and simple method of running software. After a few unsuccessful attempts I finally wrote a script for each of the commonly-used programs, setting the volume assignments and any other info required by the program. To avoid typing long names every time each script was named with a one or two digit number. To avoid having to remember numbers instead of program names the startup-sequence was amended so that a menu, giving all the programs available and their corresponding numbers, was written into the initial CLI, then it opened a new, small, Shell at the bottom of the screen to accept the input without disturbing the menu. In this way it is easy to add extra menus when needed and it is marvellously fast and efficient.

The next step will be to use the PD program *Setkey* to set the function keys to run the scripts. After that I want to try to use this utility to set up a Keymap to use function keys in programs instead of the normal keyboard short-cuts they all seem to use. I am constantly dismayed by programs which fail to use these wonderful keys which the nice men and women at Commodore have provided.

G E Lipscombe
Iver Heath
Bucks

JOIN THE HARD CORPS

Like many Amiga owners, the next stage in my upgrade path is a hard drive. The May issue was helpful, but the drives still looked too expensive. Adverts are appearing about a Protar drive and one from Evesham Micros which look more affordable. Lo and behold, your August issue promised to "return to hard drives to check out the new markets". I eagerly scanned the September issue, then the October issue ... but nothing on hard drives. What happened?

A J Cheney
Whelsbrake
Yorks

We are still intending to return to the subject, but articles like that take a long time to organise. It's pencilled in for the March issue – sorry about the wait

TUNE IN CHEAP

Like J F Stuart (*Amiga Shopper* letters *passim*) I am a user of the packet radio network, but I think he has made the mode sound expensive, which is a word most amateurs dislike. The prices quoted are obviously for mid- or top-range new equipment; my whole set-up has cost less than £150.

The modem in packet terms is known as a Terminal Node Controller (TNC) and a full facilities model is available in kit form for under £70. Obviously you also need

continued on page 14

continued from page 13

a transceiver. I have two, one was £70 second-hand and the other is a converted ex two-way radio from an electronics junk shop which has cost a total of £72. With this equipment connected to the serial port of my Amiga, using the comms program *NComm* I can read thousands of messages, send electronic mail around the world or chat live to my friends. I can also leave the radio gear on 24 hours (not the computer) and let people leave me messages on the TNC's PMS (Personal Message System).

I have never used a land line bulletin board but I'm sure the amateur BBS network must be comparable if not better. The boards are not specific to any one computer, as it is the TNC doing the talking. STs, PCs, Spectrums, C64s and dumb terminals all have the same access. The clever part is that the BBSs pass mail to each other so I can send a message to a friend in Canada, by connecting to the local BBS and addressing it to my friend's BBS call-sign. Most towns in the civilised world have a BBS which can be accessed 24 hours a day and messages read from or sent to anywhere in the world.

There's no phone bill, you can stay connected all night! And with the new class of Novice Amateur Radio Licence, introduced this year, the exam to gain the licence is within easy reach of anyone who can fathom out how to install a printer driver from the Extras disk.

Don't consider the image of Tony Hancock as the typical 'Ham'. The modern amateur sits at a keyboard just like you and communicates with the world between games of *Lemmings* and *Xenon II*.

Dave Seton
Cheadle
Cheshire

We take a close look at the world of radio and the Amiga in next month's *Amiga Shopper*.

GROUP SECTION

I saw in your magazine addresses of one or two Amiga user groups and I was wondering if you have any details of a group in this area, as I would very much like to contact them.

Michael Oddy
Sheffield

I am interested in joining an Amiga user group and would be grateful if you could let me know if you know of any in South Wales.

S D Kenuyn
Newport
Gwent

Refer to our user groups list which is on page 150. The nearest one to Michael in Sheffield is the West Riding group in Wakefield (0532 537), while I'm afraid we draw a blank in South Wales (although we've heard there is a good one in Western Samoa). Are there any South Wales user groups out there?

CRACKING UP

Love your magazine! Especially the frank evaluations by Smiddy. I would like to see more in the same format as the Cracking the Shell column. Question: why is it that the Amiga 1000 is not mentioned anywhere in your magazine? Not all of them were traded in for 2000s!

Juan Ramirez
San Antonio
Texas

Our reader surveys show that just over one per cent of our readers still use an Amiga 1000 alone, whereas 83 per cent have an A500, hence the bias towards the A500.

WRITING ON WORD PROCESSORS

With reference to your article on word processors in issue 6 of *Amiga Shopper*, I found it a very interesting read and I am sure readers will find it an invaluable guide to choosing a word processor. However, I would like to point out a couple of small errors in the features chart in the column for *Excellence!*.

The manual for *Excellence!* v2.00b quite clearly states that the dictionary is 140,000-plus words in length, not 90,000 words as in your listing.

Also, the thesaurus is very clearly labelled as being 1.4 million words with definitions. This also is taken from my manual, so either Jeff Walker is using an old manual or he didn't read the new manual correctly.

Andi R G Bradley
RAF Akrotiri
Salt Lake Det

Consider the record straightened.

I felt that I just had to write in to commend Jeff Walker for his amazing word processors guide.

I am writing this letter on *KindWords* 2.0, and use it at other times too. This was bought two years ago, before much competition came along. Besides, I don't really need the fancy extras that other WPs have. As this is the case, I don't intend to empty my bank account any more to buy a new one.

I am not considering buying a new word processor, yet I found the guide very interesting. This was one of the strong points of the guide – an ability to interest the readers who are not necessarily buyers. To be fair, this is the case for the majority of *Amiga Shopper*'s reviews.

Two items that Jeff omitted spring to mind. Firstly, a word-count facility. This is something that *KindWords* does not possess, but would be appreciated by me, for essays that require a specific number of words, at school. Another is the ability to save the default settings of the program, for every new document started. Every time I print a new document, I have to change the page-size settings. This can get fairly annoying.

Paul Rose
Radlett
Herts

Whilst I applaud Jeff's excellent and informative review of word processors and value his judgement, there is one important benchmark measure he failed to consider, that is the speed for the spelling checker. This may not be an important consideration to budding publishers, but to those of us who can't spell, it is critical.

Having both *KindWords* and *ProWrite* available and installed on an Amiga 500/A590 combination, I carried out the following test in the interest of a fair trial. I assembled 50 common words between seven and fourteen characters, and introduced a random but typical range of spelling errors, double characters, missing characters etc. The list was then submitted to both the *KindWords* and *ProWrite* spelling checkers and the performance measured in terms of the time it took to come up with a suggested correct spelling. The following are four typical results:

	KindWords	*ProWrite*
Contriversiall	3.4 secs	22 secs
Catastrofic	2.7 secs	11 secs
attetude	3.1 secs	2.9 secs
trianguler	2.6 secs	9 secs

The averages for the full 50 words were 3.1 seconds for *KindWords* as against 15.6 seconds for *ProWrite*, making *KindWords* some five times faster. Further, *ProWrite* occasionally failed to come up with suggestions even when only one character was displaced. It would be interesting to see how the other word processors managed.

K W Martin
St Annes on Sea
Lancashire

We will bear these useful points in mind when we return to word processors.

Thanks to Jeff Walker for his guide through the current word processor jungle (October issue).

However, I don't think he was entirely fair to *KindWords*. I changed to *KindWords* (I can't really say 'upgraded') from *Scribble!* about 18 months ago. By comparison, *KindWords*, with its no-nonsense WYSIWYG environment, is much more user-friendly. I have been impressed with its reliability and I don't think it crashed on me once in over a year, though it has started to do so frequently, recently.

I couldn't understand Jeff Walker's remarks about print quality and mixing fonts. I use a Star LC24-10 printer and find the quality eminently satisfactory. Also, as you can see (although your readers won't be able to) from this letter, it is certainly possible to mix fonts in one document, albeit not the printer fonts.

If you are looking for a no-frills word processor which you can get down to using without spending months wading through manuals, I think *KindWords* still has a lot to commend it.

David Cotton
Leicester

Further to your review of word processors in last month's issue, I'd just like to say that I like *KindWords*. It's not all as bad as the picture you painted, indeed it has several good points.

Although it can be slow sometimes it is still much better in my opinion than *PenPal*, which on large documents is unusable.

Andrew Harrison
Mexborough
S Yorks

I feel I must thank Jeff Walker for tempting me to buy *Wordworth*. I find it as good as he said it was, in fact, I would give it 89/100.

J E Roberts
Syston
Leicester

I read with dismay the very unkind review of the *KindWords* word processor and I would not even consider trading it in for *Wordworth*'s complicated system. Your article would definitely have prevented me buying *KindWords* which I have used quite happily for 16 months.

Len Boyns
Rochester
Kent

The Amiga range

Mark Smiddy provides an insight into the world of Commodore-Amiga, the machines and the men behind it.



"It was probably the single most impressive home computing development of the last decade. What's yours called?"
Mark Smiddy

Only five years ago at its launch the Amiga A500 represented a great leap forward in home computing. In a market ruled by the PC with its skittish graphics and abominable sound, the Amiga was a tornado of fresh air – even Atari's ST, launched at around the same time, could not compete.

At grass-roots level, the Amiga is a games engine - which accounts for the near-photo quality graphics, fantastic sound and use of customised hardware. But its underlying strength is its ability to multi-task (run several programs at once). Even the lowly A500 can simultaneously format two disks, download a file from a remote computer and print a document. This feature alone has made the Amiga an exhilarating piece of computer hardware – catapulting it so far ahead of the competition that they have never quite caught up.

BLITS & BOBS

The technology behind the Amiga was originally going to be bought by Atari for its then fledgling ST. But the deal fell through and Commodore purchased the company which had done much of the development work.

A1000

This was Amiga's first machine, and is long out of production. Although not immensely popular at the time, second-hand examples appear quite frequently. There's nothing overtly wrong with the A1000, but by comparison to the more recent A500 they are not good machines for first-time buyers looking for a bargain. Although the A1000 is an Amiga at heart, it is only factory fitted with 256K of RAM, and the printer and serial ports are not standard by accepted PC terms. Few hardware manufacturers support the A1000, making expansion hard to come by, and this limits its usefulness. Much the same applies to the early German A2000, which is more or less the same thing. Interestingly, the signatures of the whole design team are extruded on the inside of the case.

A500

This is currently the base machine of the Amiga range - yet that should not be taken as berating it. The A500 is an affordable and expandable micro that will grow as your needs grow. Commodore's latest machine, the CDTV, is more or less an A500 with a CD-ROM disk drive attached. (Interestingly, some pundits predict that Commodore will release a CD-ROM drive for the A500 during early 1992 – giving it almost 100 per cent CDTV compatibility.)

Current models are fitted with 512K of RAM in total as standard, although Commodore's latest *Cartoon Classics* pack includes a "free" upgrade, taking the machine to 1Mb. Whether this policy will continue remains a mystery (certainly Commodore head office is tight-lipped about it) but it seems a logical progression. Although the official upgrade is via an end-user expansion module, many machines have been shipped with PCBs ready to take the full 1Mb.

Latest rumours imply that the 68000 may be surface mounted to the motherboard, and this has ramifications for many third-party expansions which rely either on the existing expansion or a socketed CPU to work. Unofficially, Commodore's stance is simple enough: hardware developers are well aware the machine has provision for external hardware through the 100-pin edge connector located at the left-hand side of the machine.

The A500 is officially sold as a base machine – and users wanting to progress to greater things, such as processor accelerators, should buy at least an A1500 in the first place. Naturally, hardware developers disagree since they see the A500 as being the mass-market machine – something like 90 per cent according to one source. No doubt the debate

continued on page 16



The A500, officially sold as a base machine, an affordable and expandable micro.

continued from page 15

will carry on long into the night; for the foreseeable future at least, A500s are still an excellent buy.

A1500/2000

These two machines are so closely related that some A1500s still have 'A2000' printed on the rear of the case (sounds of Commodore's marketing bods shooting themselves in both feet abound). In practical terms, therefore, there is little to choose between the two. The A1500 is a dual-floppy version of the original machine and the A2000 has been uprated with the addition of a 40Mb hard disk fitted as standard.

This model was a follow-up to the A1000 and continues the modular approach adopted with the original range (although, some would argue, Commodore-Amiga copied the idea from IBM's PC in the first place). Whatever the reasoning, the 1500 and 2000 machines take up a fair chunk of desk space and are not suitable for casual home use. More suited to a business environment, these machines can happily take the weight of a monitor and have separate keyboards for ease of access and operator comfort.

The reason for the big box can be summed up in one word: expansion. Unlike the base A500, these models support a slot-based system to which the adventurous can add anything from massive (300Mb plus) hard disks to PC emulators and genlocks. This capability is what makes the 2000 series machines the choice for professional users. Internally fitted hardware occupies no more desktop real-estate than the existing machine and tends to be slightly cheaper than external equivalents. Also, thanks to the perceived market area of the machine, more professional-quality hardware is produced for these machines.



The A2000, the professional user's choice for a business environment

A3000/A3000T

These machines are currently Commodore's premier models. Originally launched in two versions (16MHz and 25MHz), the slightly cheaper machine has been dropped due to poor sales. All Amiga 3000s are based on Motorola's 68030 CPU – three steps up from the 68000 found in the other models – making them faster and more versatile than their little brothers.

They are also the only machines to feature Commodore's recently updated Workbench and, more significantly, the newest Agnus and Denise chips. This duo, combined with revamped hardware, gives the machine an extra graphics mode and a far more versatile Workbench. For example, future software will be able to run in screens that are much larger than a standard monitor – but users can navigate around them just by moving the mouse; and because the screens actually live in RAM, there will be no sluggish software-based update.

Breaking the mould of the desktop Amigas is the A3000T, a tower-based version of the A3000 engine designed to be floor standing. There is also a Unix-based version of the 3000, often called the 3000UX, but this is a developer'-only machine and has never been officially released to the public, despite some press reports to the contrary. Remember also that Commodore UK treats its market differently to Commodore US – so just because a machine is "shipping in the States" does not imply it will ever get here.

BEYOND THE AMIGA

It is just possible that Commodore might re-specify the A500 and B2000 yet again, fitting them with Workbench 2 and associated accoutrements; then again, they might not. The development costs alone of Workbench 2 must have cost millions, and to only release it with premier models seems little short of ludicrous. In fact, there seems little reason why Commodore can't market a Workbench 2-based A500 (A600?) alongside the existing range.

The argument goes something like this:

Commodore: "We refuse to upgrade machines to Workbench 2, because it will cause incompatibility problems."

Reader: "But you've said all along it was upwardly compatible."

Commodore: "It is – but most existing software isn't!"

continued on page 18

JARGON BUSTING • JARGON BUSTING

Blitter – Block Image Transfer [unit]. A piece of custom-built hardware designed to support graphics displays. It copies 'rectangular' blocks of memory at phenomenal rates and because screen displays are just windows on memory, the blitter can be used to manipulate graphics and even control disk drives. On the Amiga, the blitter (also called a blimmer or block image manipulator) has been incorporated into the Fat Agnus chip.

Bob – Blitter Object. A type of sprite (moveable screen image) controlled by the blitter. Unlike true sprites, Bobs directly affect screen memory. Also, although slower than sprites, Bobs are not limited to size and number of colours.

Chip RAM – memory shared between the custom chips and the CPU. On machines fitted with Fast RAM, this memory is usually only used for the display and sound samples. Because of the way the Amiga works, several displays can live in Chip RAM at once – even if they're hidden behind others – and this can often lead to confusing and unexpected "out of memory" errors.

CPU – Central Processing Unit. The brain of the operation – actually runs everything.

DMA – Direct Memory Access. A technique whereby data is written to, or retrieved from RAM directly instead of having to go via the CPU. DMA usually occurs when the processor is 'asleep', so to speak – while it is processing program instructions. This makes the process both transparent and very fast.

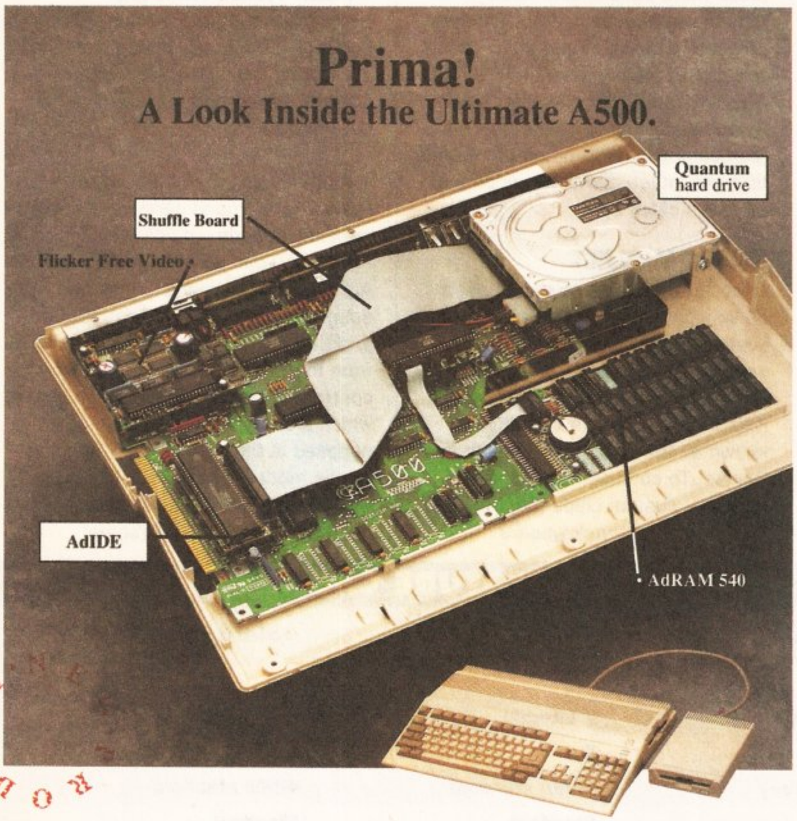
ECS – Enhanced Chip Set. An often misused term that collectively describes the recently upgraded versions of the Amiga's custom chips, Agnus and Denise.

Fast RAM – random access memory which the custom chips have no access to. The CPU can run programs slightly faster if they are located here, because the RAM access isn't being shared. The actual difference can usually only be measured in tens of microseconds, though.

MMU – Memory Management Unit. Part of the 68030 CPU – takes care of everything to do with the memory.

Sprite – a small screen object generated by the display hardware. Sprites are 'ghost' images generated as part of the display and never affect display memory – a side effect of this means that they are generated at blinding speed. More limited than Bobs, sprites can be the height of the screen, but a maximum of 16 pixels wide.

POWER COMPUTING



Prima..the high performance, low cost hard drive for Amiga 500 computers. Prima blends a large capacity, low power Quantum hard drive with the **AdIDE** host adapter for an unbeatable combination.

Prima replaces the internal floppy drive but includes **Shuffle Board** to make your external floppy drive DFO:. **Prima** features auto-booting from FastFileSystem partitions, high speed caching, auto-configuring, and A-MaxII support. Formatted capacities of 52 and 105 megabytes are currently available.

Prima comes complete with instructions, software, and all the hardware necessary for a simple, clean, no-solder installation. It does require an A500 with switching power supply, 1 megabyte of RAM, and an external floppy drive for setup and installation.

52MB **£399** 105MB **£499** Requires 1MB of RAM & external floppy drive.

A500 INTERNAL HARD DRIVE

- 20MB formatted
- 2" Hard Drive
- High quality ICD interface
- Simple plug-in fitting **£239**
- 40MB, 60MB, 80MB **£POA**

ICD

ICD AdSpeed	£175
ICD Flicker Free Video	£250
ICD FFV + VGA Monitor	£499

ICD AdRAM 2080

Expand A2000/1500 up to 9MB of RAM

AdRAM with 2MB	£179
AdRAM with 4MB	£219
AdRAM with 8MB	£329

ICD AdRAM 540

0MB (A500 only)	£95
2MB (A500 only)	£179
4MB (A500 only)	£249
ICD AdRAM 560, 2MB Upgrade	£199

Official U.K. ICD distributor. Dealer enquiries welcome

OPTICAL HARD DISK

MADE BY IBM

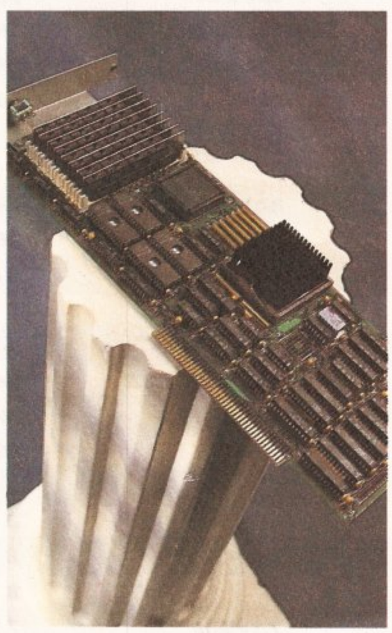


- Internal fitting for A2000 or A1500
- External cased model for fan & PSU (A500*, A2000 or A1500)
- Fully rewritable (At least 1,000,000 Erase/Write operations in any portion of the data area)
- Fits into 5·25" drive bay
- Fast 60mS seek rate
- Up to 1·5MB/s Data transfer rate

128MB Optical Hard Drive (Internal fitting)	£999
128MB Optical Hard Drive (External, cased)	£1199
SCSI Controller Card for A2000/A1500	£199
128MB 3½" Optical Media Cartridge	£36 each

* A500 requires a suitable SCSI Host adaptor, not supplied.

Shrinks hours into minutes



features

- 50MHz clock speed
- Expandable up to 32MB of memory
- 18-25 MIPS
- 68882 Maths Co-processor
- Compatible with Workbench 1·3
- Up to ten times the performance of the A3000
- Installation software disk
- Easy to install
- Hardware select switch to enable or disable 68040 mode and run original processor

£1999 inc. VAT

Comes with 4MB

68040

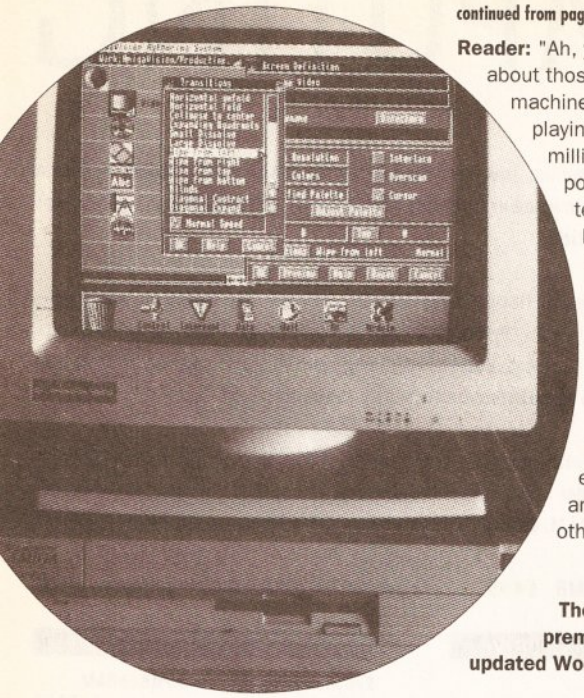
accelerator board

Amiga 2000 only



Power Computing Ltd Unit 8 Railton Road Woburn Road Industrial Estate Kempston Bedford MK42 7PN. Tel 0234 843388 Fax 0234 840234

All prices include VAT, delivery and are subject to change. Specifications are subject to change without notice. Next day delivery £4·50 (U.K. mainland only). Dealer enquiries welcome.



continued from page 16

Reader: "Ah, you mean games. What about those of us who bought the machine for everything but playing games. Why spend millions developing a more powerful system and then tell us it's too good for Mr Average Amiga User? There must be a large number of non-game players – otherwise *Amiga Shopper* would not exist, agreed?"

Commodore: "Erm, excuse me while I go and shoot myself in the other foot."

The A3000, Commodore's premier model featuring the updated Workbench and Agnus and Denise chips

Commodore UK's latest official statement is: "Never say never. We will release Workbench 2 on the A500 at some time in 1992." However, as this article was going to press there were unconfirmed rumours of a revamped A500 being shipped in the UK. Time will no doubt tell, but as history demonstrated with Atari's ill-fated STE, the older model is probably going to be a better buy (particularly for newcomers) for some time yet; at least until developers of all levels catch up.

CUSTOM-BUILT

Although the Amiga range is based on very powerful processors, it is its custom chips which make it so special. These chips, designed to take a load off the CPU, thus freeing it for other tasks, are collectively known as the PAD: Paula, Agnus and Denise. To confuse matters, there are other custom chips too, like Gary and even a custom keyboard processor! In high-end machines there's Ramsey and (for the sake of giving it a name) Dee. Here's a brief round-up of what they do:

• **Paula:** custom sound and peripherals support. Responsible for controlling the floppy disk drives and generating the nine-octave, four-channel stereo sound the Amiga has been praised for.

• **Agnus:** using the blitter, Agnus moves data around memory at mind-numbing speeds – much faster than the 68000 can achieve on its own. Agnus controls graphics, disk and sound direct memory access (DMA) and looks after all the system timing from the 28MHz clock. Agnus also controls the bobs (blitter objects), which are a type of sprite. Agnus is supplied in three versions depending on the model of machine. Fat Agnus – 512K Chip RAM (A500); Fatter Agnus – 1Mb Chip RAM (some

FEATURE CHECK • FEATURE CHECK • FEATURE CHECK • FEATURE CHECK • FEATURE CHE

	A500	A1500	A2000	A3000/A3000T
STORAGE				
Floppy 3.5-inch, 880K	1 Internal	2 Internal	1 Internal	1 Internal
Floppy 5.25-inch 720K	J	B	B	J
Hard disk	B (20Mb+)	B (20Mb+)	40Mb standard	40Mb standard
SCSI interface	B	B	Standard	Standard
Tape streamer	J	J	J	J
GRAPHICS ETC.				
Palette colours	4,096	4,096	4,096	4,096
Text	80 x 30 and 60 x 30	80 x 30 and 60 x 30	80 x 30 and 60 x 30	80 x 30 and 60 x 30
Lowest resolution	320 x 200	320 x 200	320 x 200	320 x 200
Colours	16/32/64/4,096	16/32/64/4,096	16/32/64/4,096	16/32/64/4,096
Highest resolution	640 x 512 (1)	640 x 512 (1)	640 x 512 (1)	1280 x 1,024 (1)
Max colours	16	16	16	16
Anti-flicker	J	B	B	Standard
SOUND				
Type	8-bit digital	8-bit digital	8-bit digital	8-bit digital
Volume	256 levels	256 levels	256 levels	256 levels
Range	9 octaves (stereo)	9 octaves (stereo)	9 octaves (stereo)	9 octaves (stereo)
GENERAL				
Workbench	1.3.2	1.3.2	1.3.2	2.0
DOS supplied	AmigaDOS 1.3.2	AmigaDOS 1.3.2	AmigaDOS 1.3.2	AmigaDOS 2
OS supplied	Kickstart 1.3	Kickstart 1.3	Kickstart 1.3	Kickstart 2
Processor	68000	68000	68000	68030
68010	J	J	J	-
68020/68881	J	B	B	-
68030/68882	J	B	B	-
Co-processor	J	B	B	Standard 68882
CPU clock	7.14MHz	7.14MHz	7.14MHz	25MHz
Real-time clock	B	Standard	Standard	Standard
Power				
Internal PSU	-	200W	200W	200W
External PSU	60W	-	-	-
MEMORY				
Chip (max)	512K	512K or 1Mb	512K or 1Mb	1Mb (2Mb)

A1500/2000s); Super Fat Agnus – 2Mb Chip RAM (A3000 only).

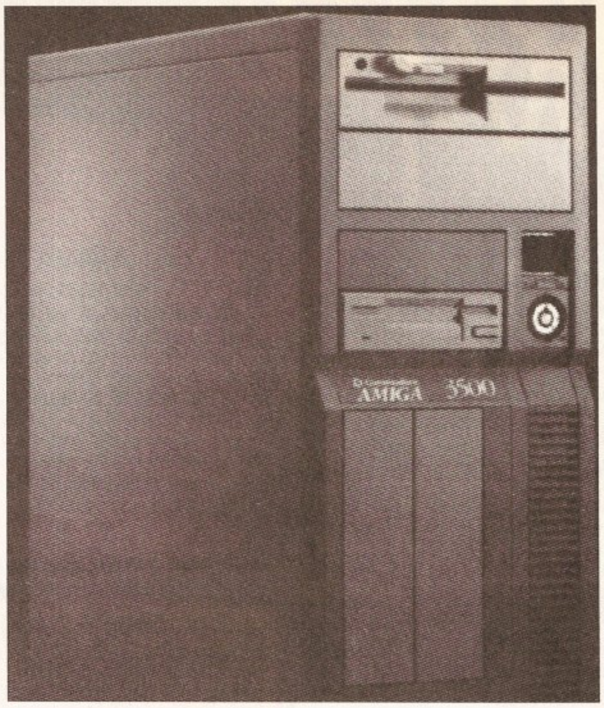
• **Denise:** looks after the screen display and all the visuals. Converts images held in RAM to images on a monitor or television. Contains hardware for up to eight sprites.

• **Gary:** Gate Array. Looks after the bus control signals and address decoding. In addition, Gary helps to drive the floppy disk interface and the keyboard-based reset.

• **Ramsey:** the RAM manager. In conjunction with the 68030's internal memory management unit (MMU), this allows the Amiga 3000 to make the best use of its available RAM.

• **Dee:** the display enhancer. Like Ramsey, this chip is only fitted to the premier A3000 machines. It's used to take the flicker out of interlaced displays.

• **Copper:** strictly speaking, the Copper is part of Fat Agnus. It's a simple processor used to control certain functions of the other custom chips. Among other functions, it allows the Amiga to provide several different display modes on the same screen. You could, therefore, have a part of a 4,096 colour, low-resolution HAM screen overlapping the four-colour, high-resolution Workbench. Although many Amiga users take this ability for granted, no other home micro has this capability. AS



The A3000T, breaking the mould for desktop Amigas.

THANKS

Grateful thanks to Steve Galeazzi (SGM, Wigan) for helping out with some of the grass-roots information

FEATURE CHECK ● FEATURE CHECK ● FEATURE CHECK ● FEATURE CHECK ● FEATURE CHECK

	A500	A1500	A2000	A3000/A3000T
Fast (max)	0K (8.5Mb)	0K or 512K (8Mb)	0K or 512K (8Mb)	1Mb (16Mb)
Maximum RAM	9Mb	9Mb	9Mb	18Mb (internal)
ROM	256K	256K	256K	512K
EXPANSION				
CPU bus	On system bus	1 x 86-pin slot	1 x 86-pin slot	1 x 86-pin slot
Video bus	None	Yes	Yes	Yes
System bus	1 x 100 way edge	5 x 100-pin slots	5 x 100-pin slots	4 x 100-pin slots
2nd System bus	None	2 x XT/AT slots	2 x XT/AT slots	2 x XT/AT slots
I/O				
Printer/Parallel	1 x Centronics	1 x Centronics	1 x Centronics	1 x Centronics
Printer/Serial	Yes (on RS232)	Yes (on RS232)	Yes (on RS232)	Yes (on RS232)
RS232	Standard	Standard	Standard	Standard
MIDI	J	J	J	J
Analogue RGB	Standard	Standard	Standard	Standard
Digital RGB(I)	Standard	Standard	Standard	Standard
Composite video	Standard	Standard	Standard	Standard
VGA RGB	No	No	No	Standard
Analogue to digital	4 – shared with mouse/joystick	4 – shared with mouse/joystick	4 – shared with mouse/joystick	4– shared with mouse/joystick
Light pen	K	K	K	K
Keyboard	94-key internal	94-key external	94-key external	94-key external
Digital joystick	K	K	K	K
Analogue joystick	K	K	K	K
Mouse (200 DPI)	Supplied	Supplied	Supplied	Supplied
Audio out L & R	2 x phono female	2 x phono female	2 x phono female	2 x phono female
TV modulator	Standard (external)	B (external)	B (external)	B (external)
Price	about £299 (2)	£999 inc VAT	£NA	£3,160(3)

Notes

(1) These are standard modes. All machines are capable of overscanning the borders, but this is not supported by all software.

(2) Currently the Amiga A500 is sold in a pack with 1Mb RAM, real time clock and a selection of games software for £399. This price is typical for the basic machine with 512K.

(3) Also available with 100Mb hard disk drive for £3,610

K Supported in hardware but equipment not supplied as standard.

J Accessory/adaptor only available from independent sources.

B Accessory supplied by Commodore and others.

Amiga For Sale...

Buying a new or second-hand Amiga or peripheral is an important buying decision – Mark Smiddy helps you to make a knowledgeable choice.

When the Amiga was launched, many considered it the most important development in home computer technology since the salad days of Clive Sinclair's ZX series. Sinclair brought home computing to the masses – creating a whole new market with affordable micros based on tried technology. The Amiga, with its designers' radical new ideas, brought forth a computer capable of simultaneously running more than one program at a time within reach of millions; and a new age was born.

Like many of today's computers, the whole Amiga range (described in more detail on page 15) is in essence very similar. The more you spend, the faster and more powerful the machines become – but all are capable of running the same wide variety of software, and with a few exceptions, the same range of hardware. Indeed, thanks to the massive popularity of the cheaper A500 engine, the choice of peripherals for the basic machine is at least as wide as it is for the higher-end models. This can leave the potential buyer in something of a quandary: "Do I save my money and go for an A500, or should I stretch to the A1500?"

Assuming you have an unlimited budget, the choice of machine is limited only by the applications you intend to run. For instance, if you want a machine to just play games the A3000 would be a waste of money. Not only would many titles run too fast, but an equal number will fail given the machine's radically different operating system and architecture. This only affects poorly written software and 'metal-bashing' entertainment titles, though. Serious applications can expect to find the same environment no matter which machine they happen to be running on: and this is the Amiga's power. Only Apple's Macintosh comes close to the same level of upward compatibility – and you have to pay a lot more for the privilege.

This article is intended as a guide for those of you who are considering buying a new machine or upgrading an existing one. The main body of the text discusses items of hardware and software with a list of typical examples. The listings are not exhaustive, and products mentioned are not necessarily recommended buys. Where appropriate, more details can be found in the relevant *Amiga Shopper* 'Supertests' – and these have been highlighted to save time. In next month's *Amiga Shopper* we'll go on to look at the vast range of software that's available.



"The Amiga is probably the most versatile micro you can buy, so let's take a look at a small selection of what's around"

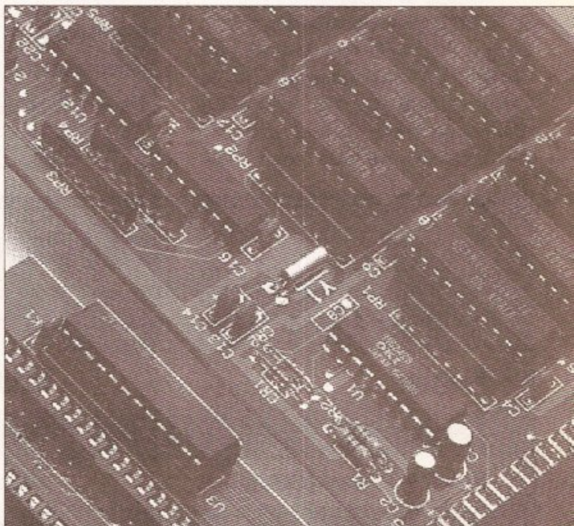
Mark Smiddy

RAM EXPANSION

Whichever model you choose, your Amiga will come with at least 512K of RAM, unless you get duped into buying an A1000 (don't). Until recently, all basic machines were fitted with 0.5Mb as standard; higher-end models come with 1, 2 or 4 Mb. Thanks to the popularity of the Amiga, the number of 1Mb A500s in use, and the falling price of RAM, Commodore now looks set to re-specify the A500 with 1Mb. Quite where this will leave specialist 'trapdoor' expansions such as the KCS PC emulator remains unclear at this stage.

This possible transition has seen recent Amiga bundles specified as "including the £99 A501 RAM expansion". It could be speculated that Commodore is having to dump remaining stocks of its high-quality, but expensive, A501 upgrade in light of many third-party developers offering similar specifications for a quarter of the price or even less! However, you should not buy an expansion which excludes a clock. The saving of around a fiver is not worth it in the long run.

The question of how much memory you actually need is dependent solely on the type of applications you expect to use. However, it should be said that 512K is not really enough for the modern machines and the current batch of high powered applications software. This 0.5Mb problem only affects A500 owners, but this machine is generally the best supported. For video, graphics and art work 2Mb should be considered as an absolute minimum – you will need more if you are really serious. And those interested in 3D rendering will have to look for even more. Typical high-powered applications such as *Vista Pro* need 3.5Mb just to run!



The more memory you have the better: you can work faster, and with bigger files.

One last point worth noting is that most internal RAM expansions for the Amiga A500, in addition to being tricky to fit, require a software patch – especially when running under Kickstart 1.2. This can be a bit fiddly to add to every Workbench disk; if in doubt, ask first. This does not affect external RAM boards, which will configure themselves correctly at switch on.

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A500 RAM EXPANSIONS

Size	Price	Supplier	Notes
512K	£20-30	Various and many!	Easy fitting
1.5Mb [1]	£79	Power Computing	Internal
2Mb [1]	£105	Roctec Electronics	Internal
1Mb [2]	£130	WTS	External/FAST
8Mb	£519	Cortex	External FAST
4Mb	£249	Power Computing	Internal/FAST

A1500/2000/3000 RAM EXPANSIONS

Size	Price	Supplier	Notes
2Mb [2]	£200	Commodore	A1500/A2000
2Mb [2]	£199	Cortex	A1500/A2000
4Mb [2]	£275	Power Computing	A1500/A2000
8Mb	£345	Power Computing	A1500/A2000
8Mb	£449	Cortex	A1500/A2000
1Mb FAST RAM	£109	Commodore	A3000 only
4Mb [2]	£500	Commodore	A3000 only

[1] Invalidates warranty. Supports 1Mb Chip RAM on some machines.
[2] Expandable to 8Mb

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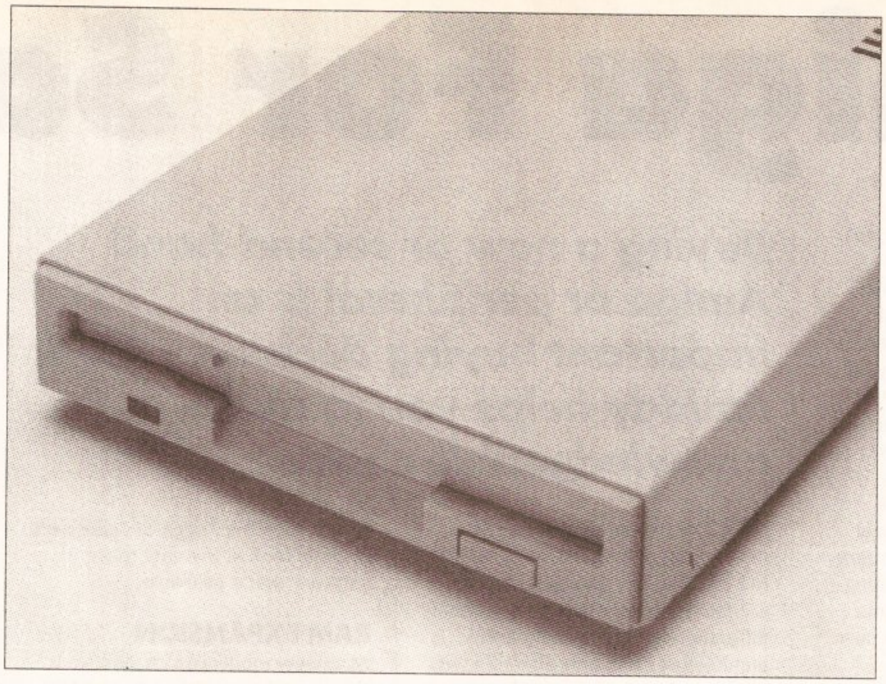
FLOPPY DRIVES

(*Amiga Shopper* Supertest April 1991)

For anything other than leisure purposes, the single floppy disk drive supplied with the A500 is a joke. Commodore finally appears to have realised this with the dual-drive standard A1500 – in reality a dual-floppied A2000. The A2000 machines and upward now come with a hard drive fitted as standard. Even so, a second or even third floppy disk drive can be a real boon. Single drive users should consider one essential; hard drive users will discover the need when the time comes to back up that sensitive information.

A500 owners should also note that it is not safe to 'daisy-chain' more than one extra drive – the reason usually put forward is the lack of PSU current. However, even though recent advances have seen several high-power PSUs appear, Commodore retains the 'two-drive only' stance, suggesting more could – in theory – 'burn out' the thin tracks on the A500's motherboard. The only solution if you need more than two drives, therefore, is to go for a unit with its own external power; and the appropriately named Power Computing is the only company currently making such a drive.

Looking at floppy drives you could be forgiven for thinking that there is little to choose between the numerous offerings available. As our unique Supertest proved back in April 91, though, there is more to the average disk drive than meets the eye; and for some unfortunate contenders, the wheels of a car! During its three to five year life-span, the average floppy drive will have to endure being dropped, washed, bashed, stood on and probably used as a cigarette stand. Interestingly, thanks to the April Supertest, two manufacturers have chosen to redesign and lower the cost of their models.



A second floppy disk drive is an essential purchase. You avoid endless disk swapping and hugely speed up your work.

AMIGA FLOPPY DRIVES AND ACCESSORIES

Model	Price	Supplier	Notes
PC880	£55	Power Computing	*Amiga Shopper* Best Buy
PC880B [1]	£65	Power Computing	New version of *Amiga Shopper* Best Buy
RF332C	£45	Roctec	*Amiga Shopper* Best Buy
Roclite [2]	£65	Roctec	New version of *Amiga Shopper* Best Buy
Internal 500	£49	Power Computing	Replacement for DF0:
Internal 2000	£50	Power Computing	Mounts as DF1:
PC880B2 [3]	£110	Power Computing	New version of *Amiga Shopper* Best Buy
Roc Knight	£20	Roctec	Anti-virus + track display
Boot Selector	£17	Trilogic	Internal fitting
Drive Switch One	£11	Trilogic	Drive disable for DF1:
DOS-2-DOS	£30	Various	Read PC Disks

[1] Virus protection, anti-click and Blitz copier

[2] Ultra slim in a new anodised aluminium case – available in black or white

[3] As PC880 but with two drives and own PSU.

SUPPLIERS: CONTACT INFORMATION

Most of the products mentioned in this feature are available from our advertisers. If you can't find what you want, don't be afraid to call the suppliers listed below. Most will be able to give you up-to-date information on their products and where to get them.

Name	Address	Telephone
Adam's World	779 High Road, North Finchley, London N12 8JY.	☎ 081-446 7170
Bytes & Pieces (Europe)	37 Cecil Street, Lytham, Lancs FY8 5NN	☎ 0253 736035
Citizen Europe	Wellington House, 4-10 Cowley Road, Uxbridge UB8 2XU	☎ 0895 72621
Cortext	Britannia Buildings, 46 Fenwick Street, Liverpool L2 7NB	☎ 051-227 2482
Entertainment International (Ent. Int.)	Unit 4, Stannets, Laindon North Trade Centre, Basildon, Essex SS15 6DS	☎ 0268 541126
Epson UK	Capmus 100, Maylands Avenue, Hemel Hempstead, Hertfordshire HP2 7EZ	☎ 0442 61144
Evesham Micros	Unit 9, St. Richards Road, Evesham, Worcs. WR11 6XJ	☎ 0386 765500
G2 Systems	5 Mead Lane, Farnham, Surrey GU9 7DY	☎ 0252 737151
HBM	Unit 3, Poyle 14, Newlands Drive, Colnbrook, Slough SL3 0DX	☎ 0753 686000

HARD DRIVES

(*Amiga Shopper* Supertest May 1991)

If you think the next best thing to a floppy drive must be a hard one, then you have probably never used one. Hard drives transform the naked and tame little Amiga into a growling beast ready to take on anyone. Hard drives are to disk drives what floppy drives are to 300 baud tape loading systems – remember those? (Even the Spectrum seemed slow at 1,500 baud.) As another comparison, you might like to imagine walking from Land's End to John O' Groats and doing the same journey by Concorde. Professional users would not consider a machine that didn't come with a hard disk as standard. With that in mind, here is a rule of thumb: never enter a shop – cheque book in pocket – and casually enquire about a hard drive.

Early Amiga hard drives were crude, slow and on the whole a bit of a slog. I mention this because they are often to be found changing hands on the second-hand market. There's nothing wrong buying a second-hand drive provided you know what you are doing, but overall, newer designs are faster, better specified and more reliable. Something else to bear in mind is if you are still using Kickstart 1.2 is that hard drives will not autoboot – this was added for release *1.3*. Also, many older designs like Commodore's 2090 do not boot from FFS partitions. This latter can cause all sorts of problems if you want to use the FFS.

Another advantage of recent models is that most supply some form of RAM expansion. For the A500 this will be in a separate interface box or inside the drive casing itself. The interface-based designs are more convenient to add RAM to, but lose out to the integrated models in terms of styling. Although few designs offer a bus throughport, the majority of other hardware using the expansion bus does supply throughports so this in unlikely to be source of heartburn. These problems do not haunt the A1500/2000/3000 machines, whose drives are usually fitted internally.



A hard disk like this Supra can add a new dimension to your Amiga. Essential for any serious work.

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A500 HARD DISKS AND SUNDRIES

Model	Price	Capacity	Max. RAM	Supplier
Supra 500XP	£489	40Mb	8Mb	Surface UK
A590 [1]	£299	20Mb	2Mb	Commodore
A590 52Mb	£490	52Mb	2Mb	Omega Projects
A590 105Mb	£640	105Mb	2Mb	Omega Projects
ICD Novia 30i [2]	£399	20Mb	NA	Power Computing
ICD Prima 105 [3]	£499	42Mb	NA	Power Computing
Protar HD	£299 up	20Mb up	8Mb	Protar
GVP Impact II+ [4]	£699	100Mb	8Mb	Power Computing
Syquest 5	£780	88Mb	0Mb	Omega Projects
Sankyo tape drive	£690	150Mb	NA	Omega Projects

[1] *Amiga Shopper* Best Budget Buy

[2] Internally fitted to all Amiga 500s

[3] Replaces the internal floppy drive!

[4] *Amiga Shopper* Best Buy

[5] Removable hard drive requires SCSI interface – eg the A590

A2000 HARD DISKS AND SUNDRIES

Model	Price	Capacity	Max. RAM	Supplier
A2901-40	£200	40Mb	0Mb	Commodore
Nexus HC	£349	40Mb	8Mb	Power Computing
Series II HC+8	£549	114Mb	8Mb	Power Computing
Series II HC+8 [1]	£369	40Mb	8Mb	Power Computing
Wordsync 2000 [2]	£449	40Mb	0Mb	WTS or Surface
Syquest removable	£690	88Mb	0Mb	Omega Projects
Sankyo streamer	£600	150Mb	NA	Omega Projects

[1] *Amiga Shopper* Best Budget Buy

[2] *Amiga Shopper* Best Buy

JCL Business Systems	Knowle Farm Clock House, Wadhurst Road, Frant, East Sussex TN3 9JE	☎ 0892 75791
Microdeal/Michtron	PO Box 68, St. Austell, Cornwall PL25 4YB	☎ 0726 68020
Omega Projects	14 Derwent Close, Culceth, Warrington, Cheshire WA3 5DY	☎ 0925 763946
Power Computing	Unit 8, Railton Road, Woburn Road Ind. Estate, Kempston, Beds. MK42 7PN	☎ 0234 843388
Protar	Park House, Greenhill Crescent, Watford Business Park, Watford, Herts WD1 8QU	☎ 0923 54133
SDL/Silica Systems	1-4 The Mews, Hatherly Road, Sidcup, Kent DA14 4DX	☎ 081-302 8811
Solid State Leisure (SSL)	80 Finedon Road, Irthlingborough, Northants NN9 5TZ	☎ 0933 650677
Star Micronics	Star House, Peregrine Business Park, Gomm Road, High Wycombe, Bucks HP13 7DL	☎ 0494 471111
Suface UK	5 Rockware Avenue, Greenford, Middlesex UB6 0AA	☎ 081-566 6677
Trilogic	Dept AS, Unit 1, 253 New Works Road, Bradford BD12 0QP	☎ 0274 691115
WTS Electronics	Studio Master House, Chaul End Lane, Luton, Beds LU4 8EZ	☎ 0582 491949
ZCL	Unit 1, Ringway Industrial Estate, Eastern Avenue, Lichfield, Staffordshire WS13 7SF.	☎ 0543 414817

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MONITORS

One of the most important parts of your Amiga system – apart from the CPU itself – is the monitor. It might seem a strange revelation to even suggest that a good monitor is a vital piece of equipment. Not so. Apart from the keyboard, the monitor is the part of the system through which your machine communicates with you. For every hour you spend at the keyboard, your eyes are transfixed on a combination of luminous phosphor and high-frequency radiation. Put another way, the more you spend on a monitor, the more time you can comfortably spend at the machine without risking headaches and eye strain. A good monitor is essential for any serious or long-term use – from word processing to desktop video.

Monitors come in all shapes and sizes – perhaps the most common is the common-or-garden household portable TV. Televisions suffer with a serious problem, though: the modulator supplied with the standard A500, although good for what it is, still degrades the Amiga's excellent video performance. Any Amiga used on a TV should be set for the 60-column Workbench and this, frankly, is just not good enough.

TV/monitors provide some comfort. Amiga video can sometimes be fed either to the composite or SCART/Peritel video input. This overrides the modulator/de-modulator problem but is still affected by the low-resolution tube found in most domestic sets. If you must use a TV for serious work, use a black and white one – not a colour set with the colour turned down.

A better option would be to plump for a proper monitor with a quoted dot-pitch of around 0.28 (lower numbers are preferred). If the dot-pitch is not specified go for medium resolution. Old CGA (PC) monitors can be pressed into service, as can the old BBC favourite, the Microvitec Cub – see *Amiga Shopper* July 1991. Better still, the dedicated Commodore unit provides good quality output at an affordable price. The same chassis is also available, badged by original manufacturers Philips, often at slightly lower cost.



Remember, you will spend a lot of time staring at your monitor so get a good one.

For power users, ie those working with DTP applications, a multi-sync monitor and flicker fixer is the only real choice. The Amiga's display is too small (vertically) to be really useful in standard mode, and the interlaced screen is uncomfortable to use for long stretches. However, such equipment does add to the cost, and is standard on the new high-end Amiga 3000 series machines.

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AMIGA MONITORS AND ACCESSORIES

	Price around	Supplier	Notes
Philips TVM	£270	Various	with Teletext!
1084S	£260	Commodore	Stereo
Multiscan	£330	Interquad	0.28 dot-pitch
8833-II	£320	Various	Stereo
Flicker Free	£250	Power Computing	A500 compatible
A1950	£450	Commodore	Multi-sync
A2320	£220	Commodore	Flicker fixer
Flicker Fixer	£150	Microway	A2000 only

JARGON BUSTING • JARGON BUSTING

680x0 – Sometimes used to refer to any model in Motorola's 68000 family of microprocessors. Currently there are five in the range: 68000, 68010, 68020, 68030 and 68040 – each increasing in speed and power.

Baud – Approximately, bits per second. A guide to the speed achievable for a serial device such as a modem.

Chip RAM – RAM fitted to the Amiga which is shared between the 680x0 processor and the specially designed custom chips for graphics and sound – the PAD. Programs executing in this area of memory run slightly slower than ones loaded into Fast RAM. The amount of Chip RAM varies from 512K to 2Mb depending on which model of Amiga you buy, and when you bought it.

Fast RAM – Refers to memory fitted to the machine which cannot be accessed by the custom chips – compare with Chip RAM. The speed difference is so slight it is almost indistinguishable. The amount of Fast RAM available is calculated by subtracting the amount of Chip memory from the total amount fitted.

FFS – Fast Filing System. A new version of the DOS filing system developed for hard drives initially but now available on floppy for Workbench 2-based machines. Although slightly less reliable than OFS (the original system), FFS is much faster and gives around five per cent improvement in storage capacity per formatted device.

IDE – Integrated Drive Electronics. Controller system used in hard drives - more common on the PC than the Amiga, though. See SCSI.

IFF – Interchange File Format. A standard system co-developed by Electronic Arts and Commodore-Amiga which affords easy transfer of data between different packages. IFF has found a home in graphics mainly, but the all-encompassing standard also supports sound, music and even formatted text.

K or Kb – Unit of measurement equal to approximately one thousand bytes. The actual number is derived in the binary system as 2^8 or 1,024.

M or Mb – Unit of measurement equal to approximately one million bytes. The actual number is derived in the binary system as 2^16 or 1,048,576.

MFLOPS – Million FLoating-point Operations Per Second. A standard speed figure quoted for many modern processors and accelerator cards.

MIDI – Musical Instrument Digital Interface. A simple standard devised to connect all manner of keyboard and musical synthesisers together and control them remotely – either by computer or by each other. See our series on MIDI for more information.

MIPS – Million Instructions per second. A standard speed figure showing raw speed comparisons. Less accurate than MFlops for number-crunching.

Motherboard – The main PCB containing all the discrete components and ICs that make a computer operate.

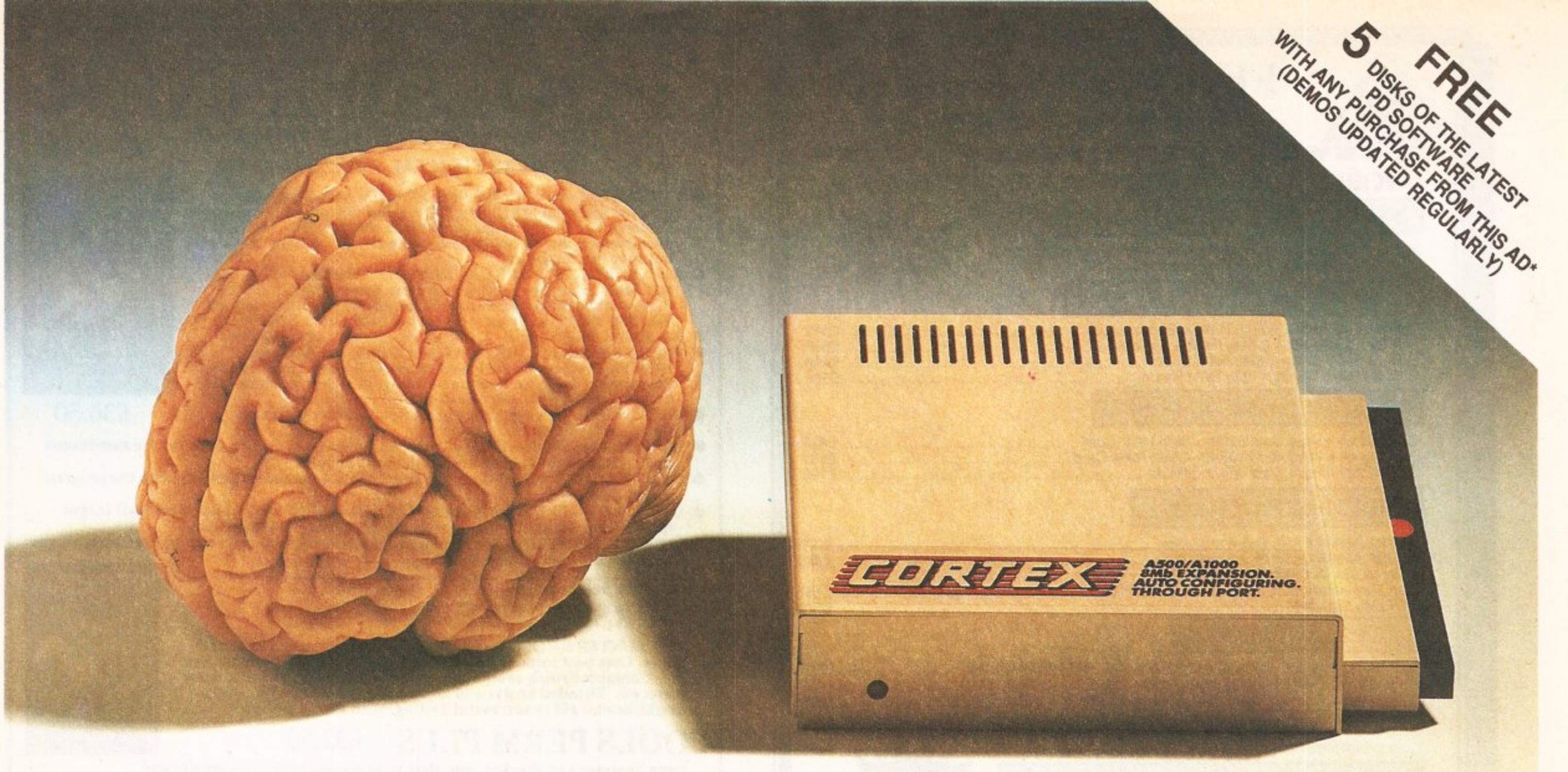
PAD – Paula, Agnus, Denise. The three main custom chips which afford the Amiga its personality.

PSU – Power Supply Unit. A mains power adaptor supplied with larger external hardware to avoid taking too much power from the Amiga A500's existing unit.

SCSI – Small Computer Systems Interface. Pronounced Skuzzy, this has become the standard interface for most Amiga hard disks and other mass-storage peripherals. This is a techie term you'll see banded around, but few users need to bother with what it all means.

SIMMs – Simultaneous In-line Memory Modules. Pre-built RAM upgrades that, although more expensive than conventional chips, are far easier to fit.

Trapdoor – Small flap underneath current A500 models where the A501 and other proprietary RAM expansion modules are fitted. The latest A500s have space for extra memory on the motherboard, so it seems that the trapdoor may soon become a thing of the past. (Although, of course, fitting RAM directly on to the motherboard will invalidate your guarantee.)



A brain   The next best thing

CORTEX 8Mb RAM Expansion for the Commodore Amiga A500/A1000

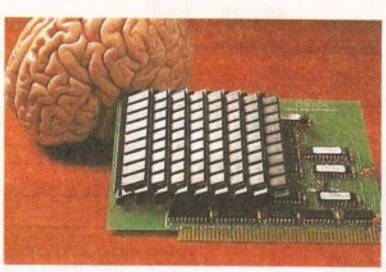
- External fitting. Warranty remains intact
- Fully implemented auto-configure
- Fully operational through-bus
- Uses standard 1M x 8 bit or 1M x 9 bit SIMMs
- Complete with its own power supply unit (UK, US or EURO)
- Designed with A1000 compatibility in mind
- Zero wait-states
- RAM test software

Commodore Approved

2Mb **£239** 4Mb **£319** 8Mb **£479**

CORTEX 8Mb RAM Expansion for the Commodore Amiga A1500/A2000

- Fully implemented auto-configure
- Zero wait-states
- Uses standard 1M x 8 or 9 bit SIMMs
- 2, 4, 6 or 8Mb configurations possible



2Mb **£185** 4Mb **£265** 6Mb **£340** 8Mb **£419**

CORTEX External 3.5″ Floppy Drive

- High-quality silent mechanism
- Enabled/disable switch
- Through port

£56

"The Cortex unit is the best that has ever passed through my hands . . . This is THE board for the A500 user who wants memory."
John Kennedy, Amiga User International, December 1990

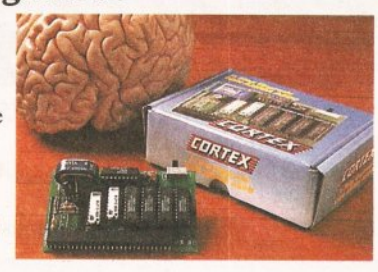
"What a joy! This really is an expansion and a half."
Pat McDonald, Amiga Format, November 1990.

"There is nothing in the universe more annoying than the lack of a through port, except perhaps the tendancy of Volvo drivers to cut out in front of my GPz550."
Nick Veitch, Amiga Computing, December 1990

CORTEX 512K RAM Expansion for the Commodore Amiga A500

- Low power 1 Mbit RAM chips
- Enable/disable switch
- "Fatter" Angus compatible for 1Mb Chip RAM
- Available with or without battery-backed clock/ calendar module **£25.95**

Clock version **£29.95**



CHIP UPGRADES

1Mb Agnus Chip 8372A - **Requires some technical skill to fit** **£60**

Kickstart ROM upgrade version 1.3 **£35**

256K x 4bit DRAM chips (for CBM A590, CBM 2091, ICD Ad RAM, Ashcom etc) **0.5Mb £25** **1Mb £45** **2Mb £85**

A3000 Static Column Mode DRAM upgrade **4Mb £249**

1M x 8 bit SIMMS for CORTEX 8Mb cards **2Mb £85** **4Mb £165** **6Mb £240**

All prices include VAT and postage & packaging.
Dealer enquiries are welcome.

CORTEX

Cortex Design Technologies Ltd. (Dept AS), Britannia Buildings, 46 Fenwick Street, Liverpool L2 7NB, England.
U.K. Tel: (051) 236 0480 ● 24 Hour Sales (051) 227 2482 ● 24 Hour Fax

★ Free software is limited to one set per order and is supplied without warranty

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PRINTERS

(*Amiga Shopper* Supertest August 1991)

No matter what sort of serious application you put your machine to, there will come a time when you need to get a hard copy. Whether it be writing a letter to the bank manager, producing a fanzine or producing a work of art, you will need a printer. Printers are probably one of the best-served areas of the microcomputer marketplace because almost all micros have a fairly standard parallel printer port. Even the ones that don't, have a serial adaptor to do the same thing. Given the vast number of PCs in service world-wide, the competition between manufacturers is, to say the least, fierce.

Generally, printers fall into two separate categories: those that use impact methods to produce an image, and those that do not. In each type you will find a wide range of prices and usually a model to suit your needs. Colour printing engines are always more expensive than their mono cousins, and you have to pay a lot to get good quality. Colour print engines costing under £1,000 leave a lot to be desired. The best ones tend to be bubblejet designs, but these are inherently expensive to run. Canon and Hewlett-Packard, market leaders in the field, both offer high-performance (near-laser quality) machines priced at under £500 (rrp).

Of the impact designs, most users will find a budget 9-pin machine is quite adequate. However, thanks to recent improvements in print-head technology, 24-pin models are now coming increasingly to the fore. For everyday basic printing work, Citizen offers a budget-priced 24-pin machine which costs less than some flashier 9-pin machines! Other manufacturers are hot on Citizen's heels, though. Star's much-vaunted LC-10 has recently been upgraded and improved to the LC-20 (an LC-10 for the Nineties, says Star). The company also offers the cost-effective mono/colour LC-200 design which, although a little slow, offers good overall performance for the money.

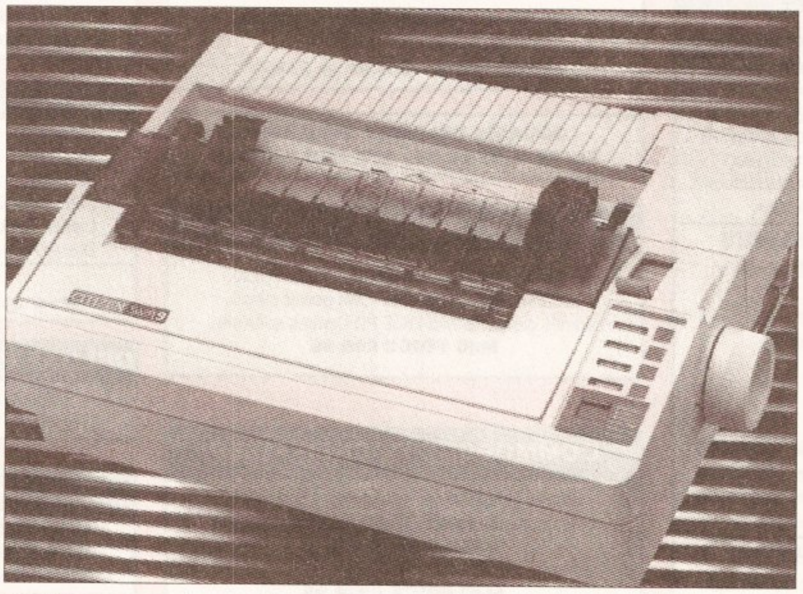
Note: most dealers now supply a connecting lead as part of the asking price. If you have an A1000 or A2000 (not B2000) you must get a special (25-way D female) lead.

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PARALLEL PRINTERS

	Price	Manufacturer	Type	Notes
120D+	£150	Citizen	Impact	Budget 9-pin
LX-850	£270	Epson	Impact	9-pin
124D •	£290	Citizen	Impact	Cheap 24-pin
Swift 9 •	£275	Citizen	Impact	Colour option
LC-200 •	£300	Star	Impact	Colour/mono
Swift 24 •	£430	Citizen	Impact	Super 24-pin
Deskjet 500	£400	Hewlett-Packard	Inkjet	Sheet feeder inc.
BJ-10e	£260	Canon	Inkjet	Mono only
BJ-330	£500	Canon	Inkjet	300DPI mono

• ***Amiga Shopper*** **Best Buys in categories.**



To get a permanent copy of your work you need a printer. 9-pin dot-matrix models like this Swift are available to suit all pockets.

SHOPPING AROUND

Getting the best system for your needs is easy; the hard part is sourcing the components at a price you can afford. One of the main aims of *Amiga Shopper* is to help you do just that. We will endeavour to give you the most up-to-date information on the best quality and most cost-effective kit around. However, you should always let your fingers do the walking and be prepared to do a little research for yourself before finally parting with cash.

The advertisers in *Amiga Shopper* are all reputable firms, but each has its own speciality. For instance, if you are looking for a new floppy disk drive it would be inadvisable to call software specialists. Similarly, if it's software you are after then a hardware specialist is unlikely to be able to give you a good deal.

This is not always true of course; many items of hardware also require support software. Sound samplers, MIDI interfaces and genlocks are three typical instances. Most dealers will bundle some form of software with such hardware – but in many cases a better package may well be available separately. In these cases you may find the hardware specialist will be able to give you a better deal – but often only at 'point of sale'. And be prepared to haggle. Although the margins on hardware are not good, many dealers value the custom in this uncertain trade, so don't be afraid to negotiate; this applies in particular to software bundled with hardware.

Finally, watch out for grey imports. Although not illegal, some suppliers have been known to supply US versions of hardware and software. This can be troublesome in two ways. First, if you need technical support, grey importers (sometimes called 'box shifters' in the trade, although the two are not always the same) will rarely be in a position to help. Moreover, if you register US software from the UK, the originating software house is unlikely to be willing to give helpline support and upgrades. Reputable dealers will be able to help and advise - although you may have to pay a little more for the privilege.

Even if you have the expertise to manage on your own, some US releases are intended for an NTSC screen and are unable to make the best use of the extra 50 or so lines available with PAL. This problem extends to items of video hardware, which will either deliver poor performance, or worse, refuse to work at all!



You can often pick up excellent bargains at computer shows, like this month's World of Commodore (see page 10).

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MODEMS

The term 'modem' is a contraction of two words: modulator and de-modulator. Modems (there are a lot of them around) are used to connect computers together over vast distances via a telephone line. Modems give you access to a vast amount of information, from the sublime to the ridiculous; you can even get 'on-line' to your favourite *Amiga Shopper* authors via the CIX bulletin board and play interactive games (games?) with real people. Through the vast number of bulletin board systems (BBSs), you can access megabytes of PD and shareware software – the list of uses is almost endless. There is one thing for certain, the world of computer communications (experts call it comms) is a bug which you are unlikely to shake easily. (However, like the infamous 0898 numbers, remember to check with whoever pays the phone bill before logging on!)

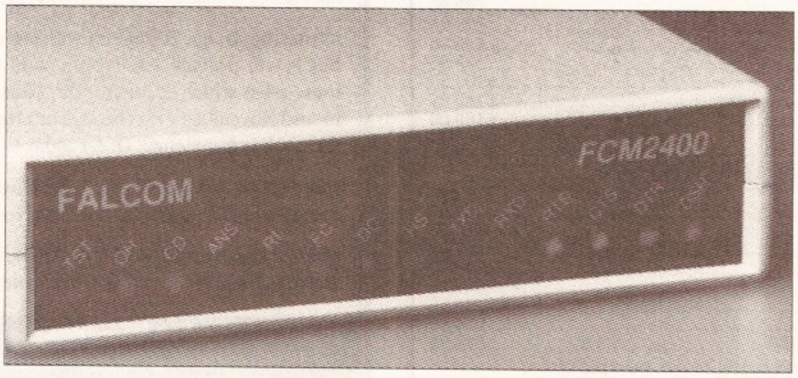
Like most computer equipment, with modems you get what you pay for. Modem speeds are often quoted using the V codes such as V21/V23 or V22bis. Respectively, these mean 1,200 baud (in)/75 baud (out), 300 baud and 2,400 baud – both ways. As you pay more you will be able to achieve speeds in excess of 9,600 baud (which is fast) with error correction and real-time data compression. Consult our regular comms features for more information. Whatever you do, unless the budget is really restrictive go for an intelligent modem (look for words such as 'Hayes compatible' or 'AT command compatible') and you should be on the right road.

One important thing to note: beware of cheap US imports. Not only do these usually come with the wrong type of telephone plug, it is illegal to connect them to any BT, Mercury or Hull City Council telephone equipment. Such equipment should carry a red warning triangle which says "Prohibited for use with equipment operated by British Telecom..." but not everything does. Approved equipment has a green circle sticker attached.

ACCELERATOR CARDS

	Price	MHz/Pro/Co •	RAM spec.	Machine	Supplier
A2030	£1,000	25/030/82	2Mbx32-bit	A2000	Commodore
HARMS Pro30	£1,100	28/030/82	4Mbx32-bit	A2000	Bytes & Pieces
GVP 3001	£2,200	50/030/82	4Mbx32-bit	A2000	Power Computing
B5000	£595	25/020/81	1Mbx32-bit	A500	SSL
B5000	£1,162	40/030/82	4Mbx32-bit	A500/2000	SSL
Microbotics VXL30 (base)[1]	from £316	25/030/nf	NA	A500/2000	ZCL
Microbotics VXL30 [1]	£1,289	40/030/82	4Mbx32-bit	A500/2000	ZCL
CSA MMR	from £390	33/030/82	up to 8Mb	A500	Bytes & Pieces
HARMS 020	from £150	8/020/81	None	A500/2000	Bytes & Pieces

• Example: 25/030/82 = 25MHz, 68030 CPU, 68882 co-processor
[1] New - comes with own 68000 for compatability



With a modem you have access to hundreds of bulletin boards and on-line systems, and you can send files around the country.

ACCELERATORS

(*Amiga Shopper* Supertest July 1991)

Not a lot of people know this *(uuuurgh – Ed)*, but the Amiga is actually quite a fast machine. Why on earth, then, would you want to speed it up even more? The need for more speed has been an obsession with computer fiends since before the pocket calculator. If someone brings out a fast machine, you can almost guarantee that within six months someone will have produced a quicker one. This has been aided by Motorola constantly reducing the price of the 68000 chips and developing faster versions. Currently, providing your bank account allowes, you can get a 68040 running at 50MHz – effectively something like 15 times faster than the standard A500!

The crunch comes when you try to choose from the barrage of technical specifications thrown at you: it's hard to discern just what phrases like "25MHz, 68881, 32-bit RAM" actually mean. There are two important factors:

1 The actual processor used. The 68000 can only execute instructions at a given speed, so by doubling the clock frequency you will barely notice the difference. The 68010 is a little better. With its small (two word) instruction pre-fetch, certain data transfer loops speed up a little. The improvement for most software is likely to be under ten per cent though. The 68020 has a 256 byte instruction cache, whereas the '030 and '040 have data caches as well. Forget what that means: in real terms, the speed increase for these beasties can be 100 per cent or even more at any given clock rate!

2 Whether or not a maths co-processor is installed. These little beasties do all the hard floating-point mathematics for the CPU – and, therefore, for your software. Since these dedicated chips, which rival the CPU in complexity, are very good at mathematics they can speed up maths-intensive applications (spreadsheets, ray-tracing and so on) several hundred fold; but only if the software supports them. Therefore, it's no good lashing out over 100 quid on a 68882 if your spreadsheet still insists on handling the maths itself.

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MODEMS

	Price	Max Baud	MNP	Notes
Pace Linnet	£230	1,200	No	Approved by BABT
Pace Linnet	£300	2,400	No	Approved by BABT
Supra 2400	£150	2,400	No	External
Supra 2400zi	£120	2,400	No	A1500/2000 only
Falcom FMC 2400	£406	2,400 (9,600)	Level 5	Approved by BABT
Supra 2400 +	£200	2,400 (9,600)	Level 5	External
Supra 2400 zi+	£170	2,400 (9,600)	Level 5	A1500/2000 only

• Numbers in brackets indicate maximum expected throughput with MNP 5 data compression. All devices listed are fully Hayes/AT compatible intelligent modems.

MUSIC HARDWARE

	Price	Type	Available from
Mini Midi	£30	Microscopic MIDI adaptor	Omega Projects
Midi Interface 2	£30	Versatile MIDI adaptor	Trilogic
Sound Trap 3	£30	Mini mono sampler and pass-thru	Omega Projects
AMAS	£100	Sampler with integral MIDI	Microdeal
Stereo Sampler II	£40	High-speed stereo sampler	Trilogic
Audio Engineer +	£199	Probably the best sampler around	HB Marketing
MiniAmp	£40	5W per channel - speakers extra	Trilogic
ZyFi	£40	Amplified speaker system	Evesham Micros
Sound Enhancer	£35	Improves high-frequency sound	Omega Projects

VIDEO HARDWARE

	Price	Type	Supplier
Colourpic	£400	Real-time frame grabber	JCL
Digi View Gold	£150	Still-frame colour digitiser	HB Marketing
Rocgen	£115	Basic genlock with fade facility	Silica Systems
Rocgen Plus	£190	New genlock with mask and faders	Silica Systems
Superpic	£500	Better Colourpic, with a genlock!	JCL
Video Toaster •	$1,600	Better than sliced bread?	NewTek
VideoCentre	£760	Super-duper studio genlock	G2 Systems
VideoCentre Plus	£1170	As above with extra fades etc.	G2 Systems

• Amiga 1500/2000 only. See the massive review in *Amiga Shopper* October 1991. Price quoted for the American (NTSC) system.

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MUSIC, MAESTRO

If you have a penchant for music, you will find the Amiga's sound – and good range of free music software – a real bonus. Although the machine has been around for some years now, there is still little to touch it soundwise. Moreover, recent developments in software have seen the four channel hardware limit pushed to eight channels – up to four different synthesized instruments playing simultaneously in each stereo channel.

Not only that, but thanks to electronic sampling each instrument could easily be anything from an acoustic guitar to Luciano Pavarotti to an entire symphonic chorus. Budding Bachs and Beethovens should have plenty to satisfy them there. And MIDI freaks will be pleased to see the range of high-quality MIDI interfaces ready and waiting to hook up to their keyboards – living proof that the Amiga is still probably the most versatile micro you can buy. The software is covered in next month's article, but here is a list of some of the hardware.

> **BLITS & BOBS**
>
> *All prices in this feature are inclusive of VAT at 17.5 per cent but are for guidance only – shop around for the best deal.*

VIDEO PRESENTATION

The Amiga is well-known for its graphics. However, not everyone knows that it has built-in support for genlock (video mixing) hardware – and this has opened the doors for a whole host of the beasties. From the casual camcorder user, through the semi-professional video production agency to a broadcast studio, there is a genlock to suit your needs. Indeed, the Amiga has been used by independent television companies for a number of years now.

At the other end of video, there are a variety of frame grabbers – little back boxes for pinching images from moving video and digitising them in all their glory. Typically, such images can be used as they are or re-touched and used in demos and animations.

For those with money to burn (and the patience for it to arrive), there is NewTek's long-awaited Video Toaster – a system for producing professional video effects, fades, blurs, wipes... you name it. Although still not available in the UK, it has already amassed more interest than the machine that spawned it – the Amiga itself. Meanwhile, over in the US, manufacturer NewTek is rumoured to be selling Toasters faster than it can make them.



A genlock like this one from G2 Systems allows you to combine video with your Amiga's output to create a range of fascinating effects.

EMULATORS

Ask yourself this: why on earth would you want your shiny new Amiga to imitate a different machine? You bought the thing in the first place for its acclaimed graphics, sound and usability – so why spend money making it behave like a tinny little 8-bit PC? The answer is software; there are something in excess of one million titles for the PC alone. Different machines have their own strengths, too – the Mac is known for DTP, the BBC for education; the PC for business and so on.

The are a wide variety of emulations, from pure hardware to pure software with some inbetween. Typically, the hardware emulators are more expensive but work better and faster because the software is running on a real machine – not a virtual one emulated in software. One exception to this rule is Commodore's BBC Emulator, which runs *BBC Basic* at something like seven times the speed of the original 2MHz BBC model B. Some emulators, such as A-Max, tread a fine line between the legal and the illegal – because the original manufacturer, Apple in this case, jealously guards its copyright. (Rightly too, in my opinion.)

It seems unlikely that such problems will be resolved in the foreseeable future. Until then you can enjoy the benefits of a wide range of machine from Spectrums to STs. The list presented below contains just a few of those currently on offer.

In part 2 next month we look at the software available for your machine. AS

EMULATORS

	Price	Emulates	RAM Modes	Supplier	Machine
Powerboard	£235	IBM PC-XT	720K + 192K	BDL	A500
AT-Once	£199	IBM PC-AT	720K + >7Mb	SDL	A500/2000
XT Bridgecard	£199	IBM PC-XT	512K	Commodore	A2000
AT Bridgecard	£799	IBM PC-AT	1Mb	Commodore	A2000
Chameleon	£30	Atari ST	512K	Deleted	A500/2000
Spectrum Emulator [1]	£3	Spectrum	NA	PD Libraries	All models
QL Emulator [1]	£3	Sinclair QL	NA	GTS	All models
CP/M Emulator [1]	£3	CP/M 2.2	64K	PD Libraries	All models
A-Max [2]	£250	Mac SE	NA	Ent. Int.	A500/2000
The Emulator	£40	BBC B+	64K	Commodore	All models

[1] Software emulation from PD libraries
[2] Works best with a flicker fixer and high-res monitor





Show your true colours

Gary Whiteley and Phil South take apart the low cost 24-bit HAM-E display enhancer and ask, could this be the best thing since sliced HAM?

The new 24-bit display systems, the so-called true colour systems, are all the rage at the moment. But what's all the fuss about? Surely your Amiga has enough colours, 4,096 at the last count. So why do we all now have to shell out for yet another card or device that gives us more colours? And besides isn't 24-bit a rather expensive way to go? Perhaps not, as the HAM-E from Black Belt Systems (distributed in the UK by Checkmate Digital) is the ideal low-cost solution to getting true colour.

WHAT IS 24 BIT?

The screens on the Amiga are made up of pixels, thousands of little dots which all have a specific colour or shade. The colour of each dot is coded by patterns of bits in the computer's memory. If the screen only had 1-bit graphics, you could only turn the pixels on or off, black or white. If you add an extra bit to the number of bits used to describe the pixels, you would double the number of colours, so a 2-bit screen would contain a possible four colours, like the standard Workbench screen. Each extra bit you use to describe the pixel doubles the number of colours you can describe. So three bits equates to eight colours, four bits means 16 colours, five bits means 32 colours – under normal circumstances the maximum number of bitplanes, as they are called, which you can use on the Amiga. Although the Amiga's palette of 4,096 colours is 12-bit, HAM mode is a simple 16-colour mode with a sort of cheat to wring a larger number of colours out of the screen.

24 bitplane or 24-bit graphics have a palette of a huge 16 million colours. As the monitor displays red, green and blue components, 8 bits each are given to these three colours. With 24 bit you have what is called true colour, which means that almost regardless of the resolution you have enough colours to represent any tones or range of tones found in nature, like all the hundreds of tones in human skin for example.

24-bit displays are not very convenient to implement on the Amiga. You need to add a bulky display board on to the machine, and you really need a pile of memory and hard disk space to store the pictures. 24-bit pictures are about 500K-1.5Mb in size in some cases, and this is where all the memory goes. With files this size, floppies are out of the question.

WHY DO YOU NEED IT?

24-bit colour is very useful in raytracing for greater realism, and in DTP for near photographic realism of scanned or digitised images. In video too the high quality of the images means you get real shading and real colour. But unless you are a professional user you are unlikely to be able to use 24-bit systems. The main reason is that 24-bit files are large and so slow to render that owners of slow machines with little memory can't have any access to this high-quality format.

But now this looks set to change as the HAM-E is a real 24-bit solution, which for very little money (compared to the thousand or so pounds you pay for real 24-bit) and through various clever tricks handles smaller files and yet gives you a 262,000-colour or 256-colour display and access to all 24-bit formats.

Anyone who uses graphics, especially in professional applications, should find aspects of HAM-E which are of use to them. Applications could include video production and display, multimedia, DTP, graphics production and manipulation, animation, image processing and picture conversion across formats.

ENTER HAM-E

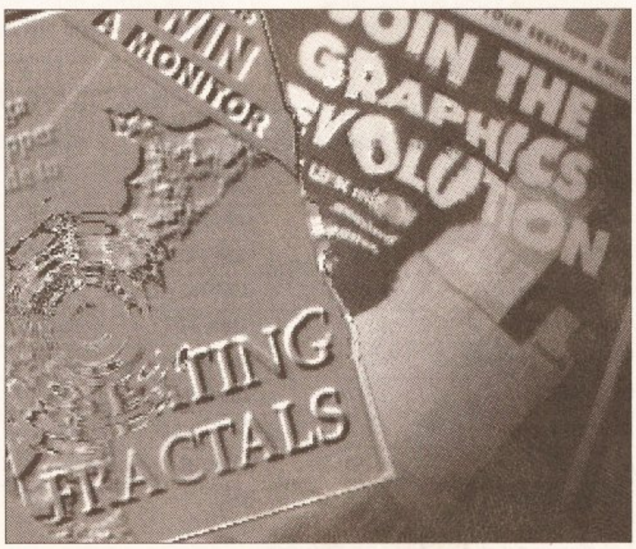
HAM-E is a true colour display system for any type of Amiga computer, which with the simple addition of a piece of hardware adds two brand new video modes to the Amiga display system. Once you've attached the box to your system via the RGB port, you have the ability to show 256 colours on your screen from a palette of over 16 million. This is the basic mode of the HAM-E, called REG or register mode. Another mode gives you 262,000 colours and is called HAM-E mode, being a sort of HAM-extended mode. The HAM-E provides normal RGB picture output to any standard Amiga monitor, most RGB encoders and most genlocks.

HAM-E does a really clever trick: using a normal 16-colour Amiga picture it displays pairs of pixels as one pixel. The regular hi-res pixel has 4 bits of colour information, so a pair of bits has 8 bits of colour information, equating to 256 colours.

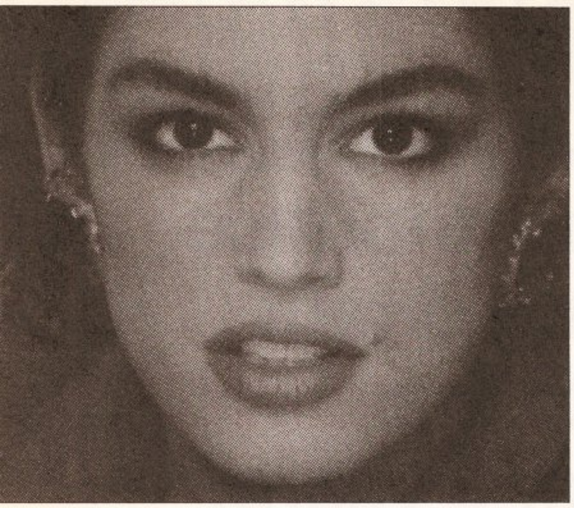
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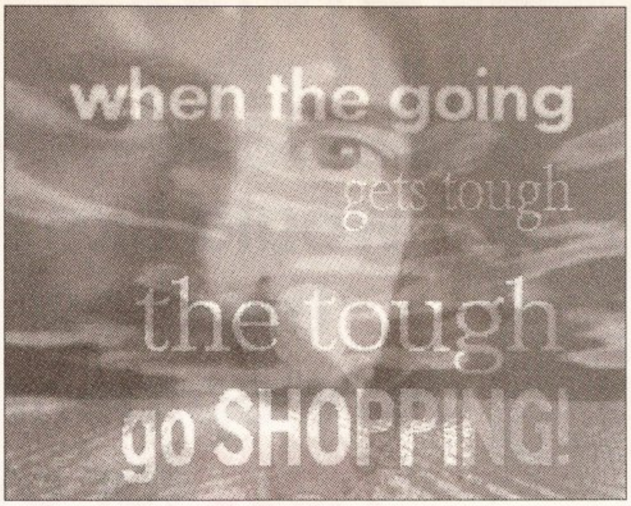
Image manipulation facilities of *Image Professional* allow pictures from several sources to be blended.



A *DigiView* Gold image, ported via ARexx to *Image Professional*, and treated by several filters.



An image in HAM-E's 256-colour REG mode. 256 colours provides a considerable improvement.



A blend of a GIF file and a digitised picture showing the use of superimposed anti-aliased text.

continued from page 32

The hardware interprets the image by looking at a little cluster of pixels at the top left of the screen, called the "magic cookie". This is like a little miniature palette, and it tells the hardware what colours to display. If the hardware finds the magic cookie at the top of the screen then the REG mode is triggered. HAM-E mode works in a similar way, and this gives you over 262,000 colours on a HAM screen, with none of the horrid fringe effects, due to the extra colours.

The effect of the HAM-E is quite startling when you set a HAM-E image and a HAM picture side by side. The increased number of shades is really noticeable, particularly with graduated shading from digitised or raytraced pictures, where the subtle effects are often lost by HAM fringing or lack of colours. The only trick in the HAM repertoire when it runs out of colours is to dither the edges between the colours, and this just looks naff. If you have enough colours, transitions between colours and shading can be very subtle and lifelike.

THE HARDWARE

HAM-E is said to work with most current video devices, though it may require modification for some items, particularly genlocks. We are unable to vouch for this statement, unfortunately not having access to everything in the video world, but we had no problems with the system.

It is an externally powered device (with PSU supplied) enclosed in a solidly constructed white metal box, with dimensions of around 8.5 x 9.5 x 2 inches. It is connected by a ribbon cable (again supplied) to the RGB port of the Amiga and also to the display device of your choice, for instance a 1084 monitor. So the HAM-E is connected between your Amiga and the monitor you have fitted.

Bundled with the HAM-E hardware you get three disks containing HAM-E utility software including *Convert, Image Professional* and *Paint*, as well as the manuals to the programs in the form of text files, plus set-up images and examples of the HAM-E format that you can load and examine. A short paper manual is also provided detailing the set-up procedure should you need it.

Unusually, the HAM-E works in NTSC mode as well as the more usual PAL, so in this case one size fits all. It's easy to install and reasonably simple to learn the rudiments of the system, although like most things in computing, mastering it is another story.

A HAM-E image can be displayed by most software capable of showing 16-colour hi-res picture files, such as *Deluxe Paint, DiskMaster, SuperView* and so forth, though the HAM-E hardware must be connected for the display to look any good. When using non-HAM-E graphics the unit simply passes the RGB signal through to the Amiga monitor and is to all intents and purposes transparent to the system.

There are two versions of HAM-E, with or without an anti-alias engine. The models we reviewed had the engine built in, though earlier versions can be upgraded for extra cost. The engine causes the number of pixels in an image to be doubled without changing the original picture size! By calculating new pixels at a rate of over 7 million per second the custom-built anti-aliasing engine can instantly improve HAM-E's output quality.

HAM-E will also take advantage of ARexx and, if you know how, you can couple HAM-E to any application which supports ARexx. Some "execute" scripts are supplied, which are mainly colour palette utilities. Through ARexx you can use *DigiView* simultaneously with HAM-E and pass the grabs directly to HAM-E as RGB data. However, this requires at least 2Mb of RAM for interlace and higher resolution images. Still, it does work and the results are pretty cool.

Should you find that the HAM-E display does not look quite right it is possible to make adjustments to the hardware to get it set up correctly for your system. This is quite easily done by adjusting several internal controls with a small screwdriver and comparing the supplied reference images. A further control is available on the front panel for making fine adjustments.

UPGRADE PHILOSOPHY

In the USA, Black Belt Systems operates a policy of free software upgrades 'for life'. New releases of bug-fixed and improved HAM-E software is posted on various BBS networks, as well as on Black Belt's own BBS. Callers can download the latest software and try it out. In fact, anyone can get hold of the software (the catch being of course that you need the hardware to do the serious image work). Black Belt also claims to supply open technical support and provide source code to the public at large if they want it. Sounds good to me! Checkmate Digital have just started their own support BBS for HAM-E, details of which can be found on page 37.

THE SOFTWARE

Image Professional is my favourite part of HAM-E and it has such a range of features that it's hard to know where to start. Put simply, you take an image and then chop it, change it, modify colours, sizes, edges, blending, mixing and other functions and come out at the other end with something corrected, composited, re-coloured, effected or otherwise jazzed up. The effects range from simple cleaning and sharpening to fantastically strange effects. And the combinations must be in the millions!

Images are loaded in to *Image Professional* for processing and manipulation. Incidentally, *Image Professional* will accept HAM-E mode pictures for input directly, but then converts them to 24-bit IFF before you can work on them.

Image Professional has a great variety of tools to work with - for in addition to the image processing functions there's also a paint set, tools for special effects and colour

GENERAL PROBLEMS

- **The hardware gets quite hot if you lay it flat, so has to be placed on its side (and a pair of the rubber feet moved to the side to lift it off the table) to let air circulate freely upwards through the unit.**
- **No real printed manuals, and the only docs are on the disk. Of course, you can print them if you have a printer, but the files can be very large: the *Image Professional* manual, for example, is 31829 words long or around 65 sheets of A4. While the software is being constantly updated, but with a set of software as versatile (and complex) as this a printed manual would be a great help!**
- **There's an occasional problem with displaying interlace screens in HAM-E while using a non-interlace Workbench in PAL. This is apparently not a problem with WB 2.0 or WB 1.3.3, but for anyone using the WB 1.3.2 you are going to be visiting the Guru if you try to mix the two together. This fault is apparently due to a bug in the Workbench, not the HAM-E software.**

IP PROBLEMS

- **Some of the numerical requesters in *Image Professional* are unhelpful in that they do not reflect how many 'units' of change you have set. So if you want to exactly repeat a process you have to estimate.**
- **No grid tool – making repetition of areas less accurate, particularly if you are concerned with producing symmetrical effects across an image.**

JARGON BUSTING • JARGON BUSTING

ARexx: A script language for writing programs to communicate between tasks on a multitasking computer like the Amiga

composition and a fully-featured palette requester.

If you look at the list of some of the features below you'll understand why this review can never do justice to the depth of *Image Professional*. It is deep. All kinds of options can be set up, including depth of blending, transparency, colour palette, display mode, brush type, primary, secondary and other buffers (where image data can be held) amongst a whole host of others. Full descriptions would probably take up half of this issue!

There are some functions which are common to many of the various main program areas. For instance, the blend settings and the shapes for image processing (rectangle, ellipse, freehand, polygon etc) are also used by the Paint, Compose and F/X menus.

Other functions, such as Area Fill and Line Draw, have subrequesters for setting styles such as blend, transparency, fade length and other functions which will affect all subsequent operations until reset or changed. By using these sub-menus many complex effects can be set up.

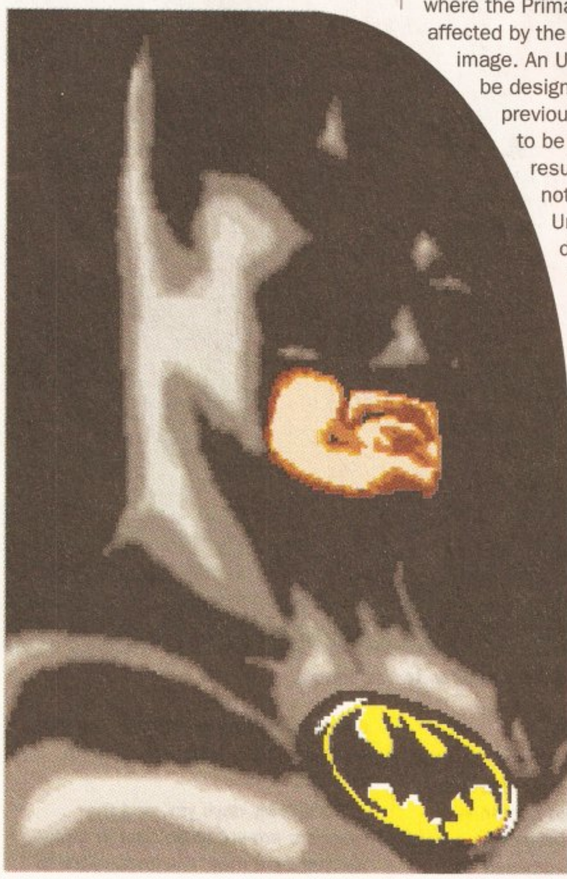
From the Paint area of *Image Professional* many common painting tools are available, including line and filled area drawing and font entry, all of which can be affected by current sub-menu settings. As a result an ordinary paint function such as Area Fill can become very powerful – with warping, blending, colour ranging and transparency effects all playing their parts in the manipulation of the current drawing brush or image.

Each image or brush (clip) is allocated its own memory buffer and the number of buffers available depends on the total free system memory. As usual, higher resolution images use more memory than lower ones. All clips and images currently in memory can be selected through the Buffers menu and designated either as Primary ("foreground") and Secondary ("background"). Primary and Secondary buffers are required to carry out compositing operations such as rub through and merge, where the Primary image will be affected by the underlying Secondary image. An Undo buffer can also be designated, allowing a previously unaffected image to be restored if the results of an effect are not to your liking. Unwanted clips can be deleted to conserve memory.

Image Professional can hold up to ten macro commands of up to 255 characters each, which means that you can write your own command sequences to control processes which are repetitive or too complex to work through in normal ways. ARexx is required to run Macro Commands.

Working with *Image Professional* can be demanding – as with most things in life (and even computers) you take out in proportion to what you put in. For good results you need to spend time experimenting with as many aspects of the software as possible. This will take time, so be prepared to stick at it. Of course, some things can always be done quickly, and the results can be very rewarding. But if you want to do some really special compositing and processing then you'll really have to understand what you're doing.

continued on page 36



Using *Register Paint* as a straight painting package can produce good results.

CHECKOUT
IMAGE PROFESSIONAL

Documentation ●●●○○
Disk-based, like *Convert's*.

Ease Of Use ●●●○○
Necessarily complex in places, though not so difficult once you've got the hang of it.

Flexibility ●●●●○
Extremely flexible – with more features added at every upgrade! But the PAL Interlace bugs need fixing by someone.

Speed ●●●●○
Depends on your system, and the process taking place, but generally it's pretty quick, considering.

Overall rating ●●●●○
A strong piece of software marred by niggly crashes and bugs. Otherwise definitely very interesting.

THE OPTIONS AVAILABLE IN IMAGE PROFESSIONAL

PROCESS MENU
- Contrast
- Bright
- Gamma
- Sharpen I
- Sharpen II
- Smear
- Decontour
- Contour
- Remove Isolated Pixels (RIP)
- Remove Isolated Smears (RIS)
- Remove Isolated Chunks (RIC)
- Implode/Explode
- Motion Blur
- Spiral Blur
- Make Monochrome
- Make Luma
- Monochrome Negative
- Luma Negative
- Colour Negative
- Colourise
- Pseudo Colour
- False Colour
- Line Art
- Edge Line
- Motion Blur
- Hue
- Saturation
- Solarise
- Pixelise
- Horizontal Flip
- Vertical Flip
- Colour Derivative
- White Balance
- Grey Balance
- NTSC Limit
- NTSC Filter
- Reduce Glare
- Area Fill
- Gradient Fill
- Colour Set
- Gradient Colour Fill
- Point Cellular
- Asterisation
- Histogram Equalisation
- Antique Tint
- UnAntique
- BluePrint
- Remove Features
- Clip Region
- Set Blend
- Stretch Clip
- Rotate Clip
- Dynamic Range
- Anti-Alias
- Thin
- Thicken
- Low Pass
- High Pass
- Posterise
- Connect
- Disconnect
- Define Colour
- Make Mask
- DigiView Correction

F/X MENU
- Oil Brushed
- Radial Wave
- Geographical Elevations
- Shadowed Elevations
- Colour Mapping
- Relief
- Mirror
- Wave Distort
- Caricature
- Dome
- ZigZag
- Scan Contrast Correction
- Load Colour Map
- Lined
- Melt
- Shear
- Make Shine
- Random Tile
- Contour Line
- 3-D Net
- 90 Degree Rotation
- Pad To Aspect
- Realign Colour Guns



A selection of the *Image Professional* effects listed on page 35 were applied to this image.

continued from page 35

CONVERT

In many cases you'll need to convert an image into 24-bit IFF to be loaded into HAM-E. Images can be converted by using the supplied *Convert* software, or other software such as ASDG's *Art Department Professional* which already supports HAM-E format directly.

Convert will accept around 45 different types and sizes of input files including those in Opticks or TARGA format, raw RGB files (as produced by Byte by Byte's *Sculpt Animate*), all IFF formats, GIF, ARZ0, ARZ1, AHAM, SHAM, RGBN, RGB8, *XSpecs* and *DigiPaint*, and output a 24-bit IFF file. Simply load a file from the easy-to-use requester and then tell it where to go when converted. Fast and easy. That's all there is to it. The only image we couldn't convert was a 1,024 x 768 256 colour GIF image – and that was probably due to memory constraints.

If you wish to get a little more complicated it is possible to invoke *Convert* from the CLI and add further instructions for scaling an image in terms of absolute pixel size, percentage size or a combination of both.

All the pictures we converted were fine – these included GIF, RGB, HAM and Impulse RGBN formats.

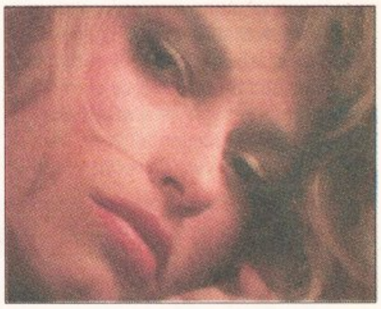
REGISTER PAINT

After *Image Pro* and *Convert*, *RegPaint* seems like a bit of a come down at first. The main screen is less interesting and the design seems to be a little ill-devised and forbidding. Fiddling around with the buttons and icons before fully reading the manual on the disk yields little to encourage you. Reading the manual is no picnic either, as you can either load it into your favourite file reader or use the one on the disk; text is hard to grasp on the screen, especially with no pictures.

It's early days yet, and the manuals are yet to be cast in stone. Be that as it may, it's impossible to read the section you want to look at and use the program at the same time unless you have a huge amount of memory and can multitask the two programs. Still, the printed manuals are on the way and this will make life more than a little bit easier.

Once you have a grip on what the various tools do and get used to the slightly slower method of working when you're shifting around such large amounts of colour data (especially with some of the more advanced transforms), painting with *RegPaint* becomes a lot more enjoyable. Although it has to be said that the program suffers from not using a more Amiga-ised interface, and a lot of the time it's a trifle frustrating not to know exactly what a function does. Pressing the icons with the mouse sometimes doesn't seem to do anything, although it could just be that an accelerator would be in order.

Icons or buttons are alright, but a few more menus would be preferable. Although the tools are very advanced, and the facilities and colours available in the program are very good, the functionality of the program is marred by the icon buttons, which work in a more than slightly cack-handed way. In order to get to a certain function you have to click repeatedly on a button to cycle through the available options – on some there are upwards of six or seven options, which makes for a lot of tedious clicking. You can hold down the shift key and cycle back, but this isn't as intuitive as, say, clicking the left mouse to go one way and the right to go another way, or



The original, unedited, picture for comparison.

CHECKOUT
CONVERT

Documentation ●●●○○
Good, but currently disk-based. If you don't have a printer then you're a little stuck.

Ease Of Use ●●●●●
Couldn't be simpler, and the menus tell the whole story.

Flexibility ●●●●●
Very flexible, converts manifold formats to IFF24.

Speed ●●●●○
Quick and efficient, especially with ARexx in tow.

Overall rating ●●●●○

A good converter, all told.

SOFTWARE THAT SUPPORTS HAM-E?

Considering that the HAM-E is such a new product, it's got some pretty heavy duty players interested in supporting the standard. Software currently supporting HAM-E file types includes the free software *Convert*, *Image Professional* and *Register Paint*, obviously, but also the following current and forthcoming products support HAM-E directly:

***HAM-E Workshop* (from HoloSoft)**

***Spectracolor* (Oxxi Aegis)**

***Art Department Professional* (ASDG)**

***VistaPro* (Virtual Reality Labs)**

***3D Professional* (Progressive Peripherals)**

and indeed any Amiga software capable of 16-colour hi-res display, including *Deluxe Paint*, AMOS, *CanDo*, *SID* and almost any other file viewer, and there are many more programs waiting in the wings.

better yet having a menu option on the title bar.

But to put this in perspective the program is actually quite good, once you've got used to fiddling with the icons. It's really useful to have 256 colours at your disposal, even if they are a tad hard to get at. After using this program for a while you will get used to its little foibles, and get to the stage of just enjoying having so much colour to play with. And there are some very good effects for you to use, like glow ranges for example, and although the program has its flaws and it could be miles better, there's no denying the power of this software.

HAM-E is a device which is still in a state of flux, and although support for the HAM-E in third party programs is now well under way, it's taken a little time to get there. The version of the *RegPaint* software I used was a little bit unpolished, perhaps a bit clumsy, but the process of revamping the software is ongoing, with this current version being far superior to the versions I saw last year. By the time you read this any minor problems will have doubtless been ironed out with the next version of the software, which promises to be faster and much more solid.

All in all *RegPaint* is a powerful and impressive demonstration of Reg mode, and although, in a lot of ways, I prefer *HAM-E Workshop* as a program, *RegPaint* is still a powerful and colourful paint program.

HAM-E WORKSHOP

This program is an optional extra, as it doesn't come with the package itself, but is available separately for about $50 in the US. (The UK price hasn't been set yet.) *HAM-E Workshop* is a special HAM-E version of the *Graphics Workshop* program; a recent addition to the "paintimation" wars competing with *Deluxe Paint* and *Spectracolor*.

HAM-E Workshop requires a little more memory than one would expect. The test machine was an A500 with 3Mb RAM, of which 512K was Chip RAM. The lack of Chip RAM may have been a problem, as we kept getting an out of memory error and a crash whenever we tried to load anything complex. There were some other bugs, but as we went to press heard that a new version was on the way which fixes some of the problems.

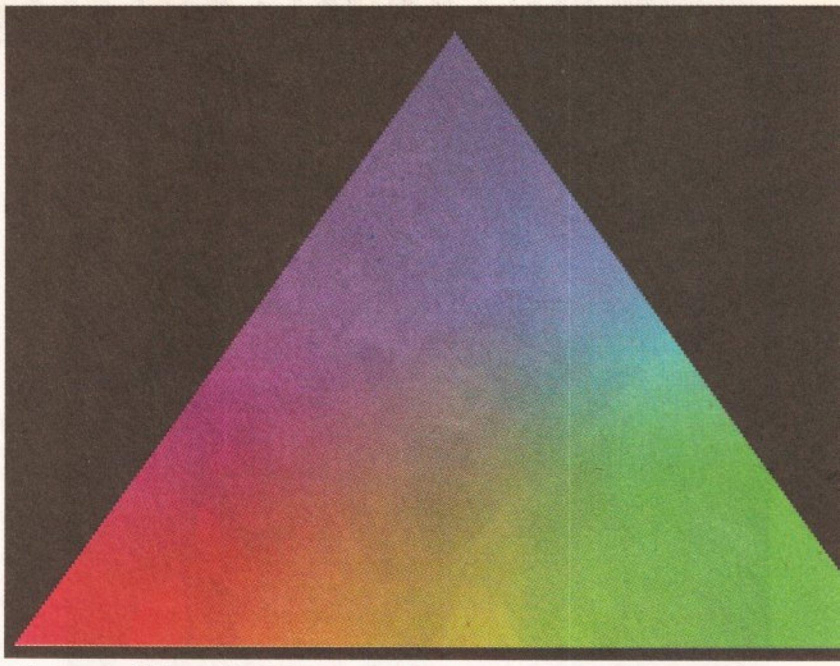
It's easy to see from even a buggy version that this could be a good bit of software. Even though it does use a little forest of icon buttons down the bottom of the screen, it has a small fleet of menus at the top. The program will load HAM-E pics of course, but will also load standard IFF files, allowing you to add a 256-colour feel to anything you've been doing before using a more conventional package. Once you have a HAM-E style picture you can use it in your own software with the right file viewing routines, or you can load it into an additional program, like *Art Department Professional* for still more processing. You could even generate a HAM-E picture, and then using ADPro convert it to a 256-colour PCX picture to go into a PC clone!



You don't have to use the system for image manipulation just draw away!

For the program to be improved, besides fixing the bugs, mentioned above, the animation features need better documentation as there is not nearly enough. The prospect of 256-colour animations is enough to make you dribble.

The font handling in *HAM-E Workshop* is excellent, and includes an interactive font requester which enables you to see the fonts as you select them. The one tool I do object to is the RAYS tool, where you can draw a number of lines on the screen, all of which have the same origin. How amateurish. But, all told, the tools are very good, especially the brush effects, including tinge, stain and shadow effects.



Just some of those 300,000 colours! In fact the monitor can show even more.

The animation facilities are very nicely done, with more than a passing resemblance to *DPaint's* animation feature. In fact you hardly need any documentation to use the program's animation if you are used to *DPaint's* animation requester. You can store up to 10 brushes for animating around the screen, using a number of special effects like fading or easing in and out. All the moves are done automatically from the animation requester, and the animations are divided into two types, either normal straight-through animations or "cells" of frames that can be sequenced and looped to make quite long animations. That's a feature found on sound samplers, but never on animation programs.

Graphics Workshop is a great program, and allows you to get at all of HAM-E's important little places. Although it doesn't handle HAM in any form, it is a solid animation and paint program which lets you draw in 256 colours, and is the best HAM-E paint program so far. It remains to be seen if the new HAM-E version of *Spectracolor* is better still.

Overall, HAM-E is a huge step forward in true colour work on the Amiga at a truly affordable price. Worth more than a look!

You can contact the authors via E-mail: Gary Whiteley as DrGaz@CIX and Phil South as Snouty@CIX AS

SHOPPING LIST

HAM-E £299.00
standard model
.... £399.00
with anti-alias engine

Checkmate Digital
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London
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☎ 071-923 0658 (enquiries)
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CHECKOUT
REGISTER PAINT

Documentation ●●○○○
Disk-based, and enormous too, so printing out is almost entirely out of the question unless you have about six months to spare.

Ease Of Use ●●○○○
Hard to get the program to do what you want.

Flexibility ●○○○○
Loads IFF files as well as HAM-E format.

Speed ●●●●○
Although some features appear to lock the program up, the drawing speed is very good.

Overall rating ●●●○○
Although there are still problems with this program, it shows great promise. A major redesign of the interface is needed, but the actual quality of the tools is good.

LATE NEWS

Proper printed manuals are reportedly on their way, but haven't reached these shores yet. Just like in the States, upgrades of software are available either on disk (for the price of a disk and SAE) or from Checkmate's own bulletin board on 071-923 2608 (which also carries CanDo as well as other areas for other Checkmate products like its A1500 and IQLR 500 Amiga workstation expansion cases).

CHECKOUT
HAM-E WORKSHOP

Documentation ●●●●○
Nicely printed spiral bound book, containing an excellent separate tutorial section.

Ease Of Use ●●●○○
Very easy to use although a tad bugged in this current version, soon to be replaced to solve some of the problems.

Flexibility ●●●○○
Loads IFF and HAM-E format pictures.

Speed ●●●○○
Drawing speed is very good, although some processes slow the program up considerably.

Overall rating ●●●●●
The best HAM-E paint program so far, although it remains to be seen what effect the Spectracolor program has on this assessment.

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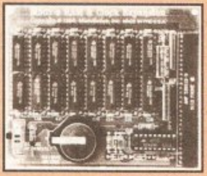


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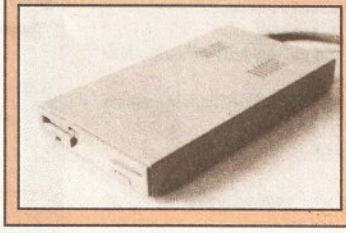
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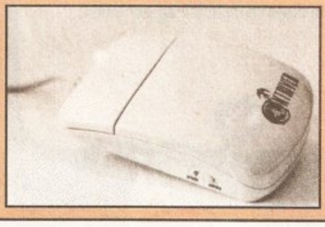
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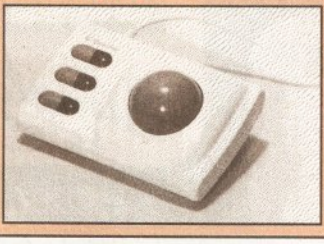
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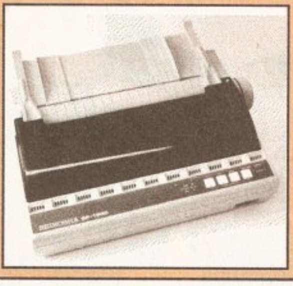


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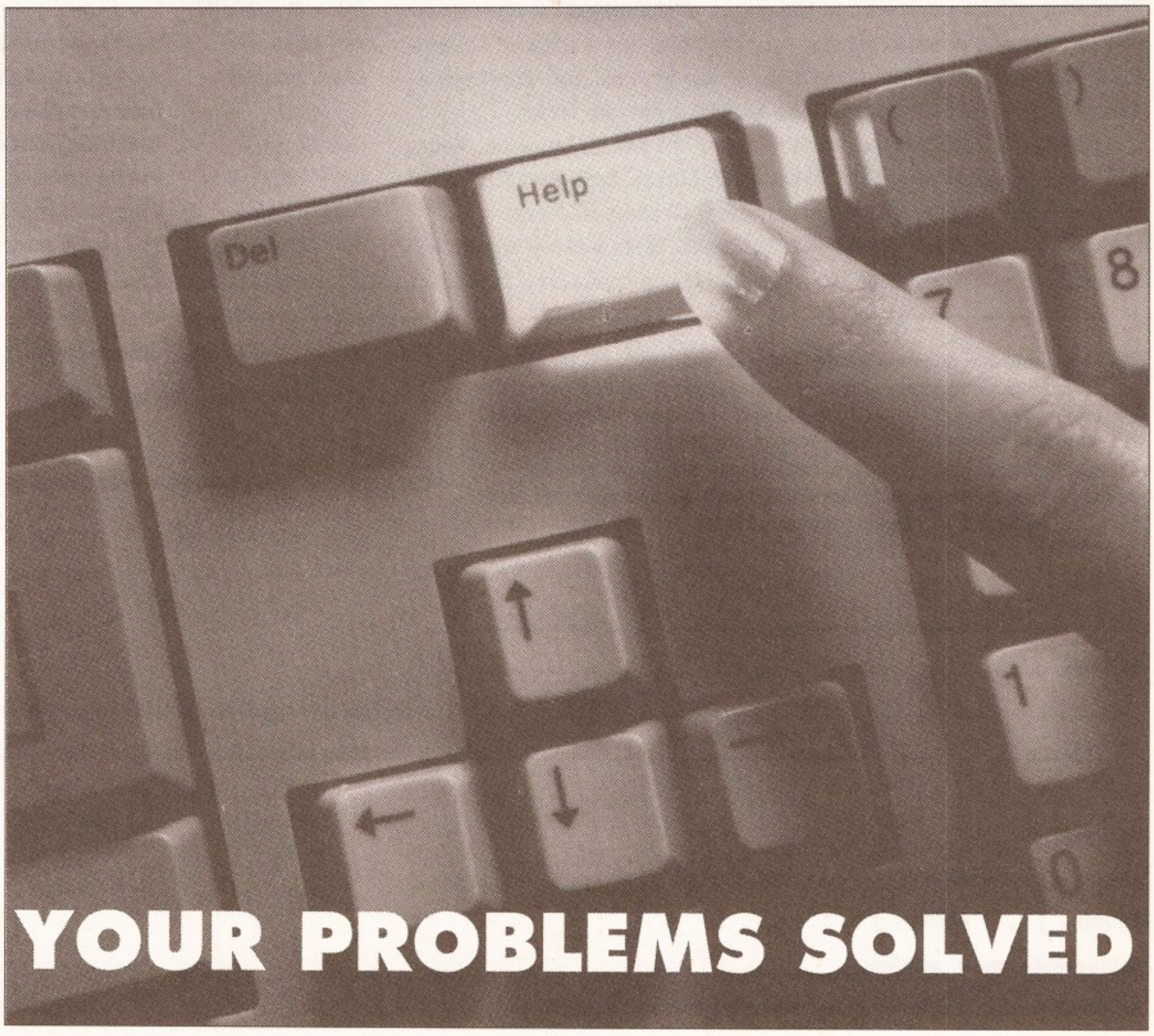
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CONTENTS AT-A-GLANCE

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AMIGA ANSWERS



SO WHAT DO ALL THOSE ICONS MEAN?

Beginners: this icon will appear next to any questions which are 'basic' in content.

General: this icon is used for any general Amiga-related queries.

Caution: be sure that you fully understand the answer before trying it out.

Danger: the answer to this question could well invalidate your warranty – or you!

Hardware: this icon is used to denote questions relating to general hardware.

Buying advice: we use this icon if the question asks us for buying advice.

Printers: this icon denotes a query about printers, printer drivers and so on.

Technical: any queries about programming will have this icon next to them.

Video: this icon relates to any query about using your Amiga with video hardware.

Music: this icon is for questions about MIDI, sampling, synthesizers and so on.

Programs: any program-specific queries have this icon next to them.

Comms: if your question relates to comms, this is the icon that we'll use.

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We also cannot enter into personal correspondence – all enquiries will be dealt with in the pages of the magazine. This does mean a bit of a delay in solving your problem, but you'll just have to be a little patient and wait for it to appear in print. You won't get a personal reply even if you enclose an SAE with your letter.

Send your question on the form below to: Amiga Answers, *Amiga Shopper*, Beauford Court, 30 Monmouth Street, Bath BA1 2BW.

The Amiga Answers panel consists of all three of *Amiga Shopper*'s consultant editors – Jeff Walker, Mark Smiddy and Phil South – and, of course, our resident technical editor Cliff Ramshaw. We will also be calling on the services of all our other contributors, so you won't be able to catch us napping whatever the subject of your query.

Each panelist will be dealing with queries in their own specialist area(s) so it would help us greatly if, when writing, you label your query envelope with the name of the expert who can solve your particular problem. Below is a list of their areas of expertise. It's a list that we will add to and update every month, so you will know who to write to about any subjects not mentioned here.

Gary Whiteley –	Video
Paul Overaa –	Programming, music
Mick Draycott –	Hardware, programming, MIDI
Jeff Walker –	Desktop publishing, programming
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Phil South –	Graphics, AMOS
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If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. Send your form and question to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Sorry, but we cannot personally reply to any questions – even if you include an SAE.

Name: ____________________

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____

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Your machine:

A500 ☐ **A1000** ☐ **A1500** ☐

A2000 ☐ **A3000** ☐

Approximate age of machine: __________

Kickstart version (displayed at the 'insert Workbench' prompt)

1.2 ☐ **1.3** ☐ **2.x** ☐

Workbench revision (written on the Workbench disk)

1.2 ☐ **1.3** ☐ **1.3.2** ☐ **2.x** ☐

PCB revision (if known). Do not take you machine apart just to look for this! __________

Total memory fitted (see AVAIL in Shell for 1.3 Workbench) __________

Chip memory available (see AVAIL in Shell) __________

Agnus chip (if known) __________

Extra drive #1 (3.5"/5.25") as DF__: Manufacturer __________

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Details of any other hardware which could help us to answer your question:

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

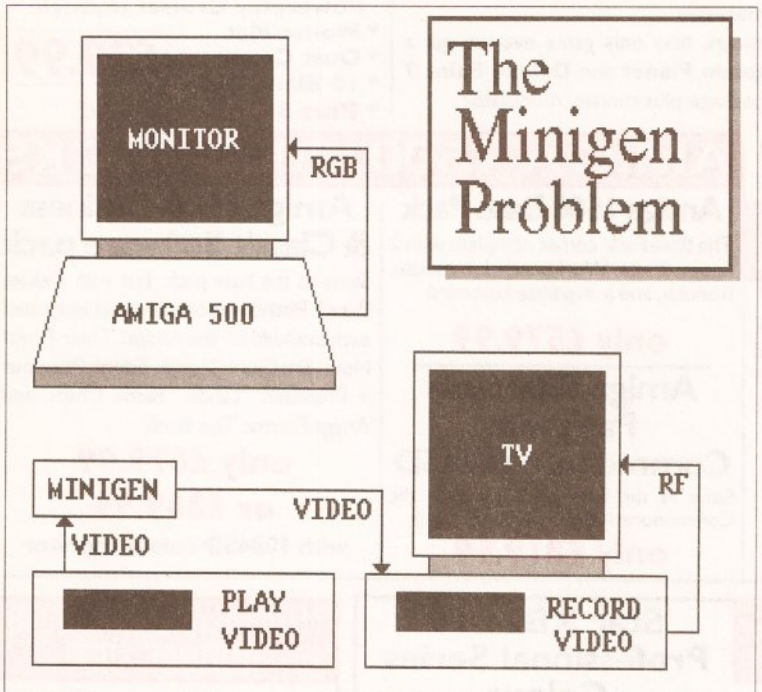
AS 8

JOINING GENLOCKS

I wish to add titles and graphics to my collection of videos, and I have been experiencing problems connecting my Minigen and getting output. I enclose a diagram of my set up. I can use *Deluxe Paint* all right and get titles on the screen, so what am I doing wrong? Should I buy a better genlock? I would also like to know if I can save programs to program disks or must I use blank disks?

EC Foot
Stroud
Gloucester

The solution to your first question is very simple – the Minigen has to be connected to the RGB connector of



The intricacies of Amiga, video and genlock connections

your A500, since the principle of a genlock is to synchronise computer signals to incoming video. The way you currently have the system set up (see diagram), your Minigen is not connected to the Amiga at all. The remedy to this is simple – plug the Minigen into the A500 (making sure the power is off when you do so). Since the Minigen does not pass the RGB signal through (unlike many other genlocks) you must then feed your CM8833 monitor with a composite video signal. The best place to obtain this would be from the video output of your record VCR. Switch your CM8833 to composite (CVBS). Then, using the switch on the Minigen to set Amiga, Video or Overlay you should be able to see the Amiga graphics and/or video signals on your CM8833. You could probably dispense with the TV if you wanted to, as you can see all the signals on your system this way. Note that the composite signal will not be as good as the RGB from the Amiga when displayed on the CM8833.

If you like the output from the Minigen, why buy another? If you want RGB pass-through, then you'll have to.

Lastly: yes, you can save to the program disks, but this is *not* recommended as you risk erasing or otherwise corrupting your valuable software. Whenever possible make back-ups of your program disks and use these to run the software from. Saving programs and pictures is often best done to disks that you have prepared for the purpose – since they will have far more space free than program disks anyway. Just format your disks, name them as you like, and save data to them. You can be more refined later on as you become more familiar with the Amiga's methods, but for now this will save you risking your master disks. *GW*

COPING WITH COPPER

I have read in books and magazines about the co-processor and its copper lists, and they sound quite easy to manage (not to mention interesting). However, there is a small problem, because all the examples I've seen use assembly language and I am still trying to master C. Whilst I am not totally against starting to learn assembler, it would be nice to see an example written in C. Here are some ideas I have had so far for a (hopefully) simple starting point:

- **Try to find the Screen structure for the WorkBench**
- **From this get the ViewPort structure**
- **Retrieve the pointer to the UCopList structure**
- **With the above pointer initialise the copper list using CINT()**
- **Write the copper program using the CMOVE() and CWAIT() macros (this is where I get stuck!)**

Does this sound feasible or is it a load of rubbish? Either way, a short example would be much appreciated (I am using *SAS C 5.10*).

Also, do the *ROM Kernel Manuals* deal with programming the co-processor from C?

Graham Allwood
Knaresborough

As far as the last part of your question is concerned, this is the situation: The graphics sections of the Addison Wesley *Libraries & Devices ROM Kernel Manual* do include quite a few references to copper-oriented operations, and the *Includes & Autodocs Manual* certainly provides all the headers and function details you'll need. It is however the *Hardware Manual* that provides the 'nitty gritty' programming details, but here, unfortunately, a lot of the material is aimed at the assembly language programmer.

The bad news then is that you are not going to find much in the way of introductory 'copper trick' applications program examples written in C in any of the official manuals (or anywhere else come to that). There's some great copper list demo code floating around in the public domain, but this also is usually offered as assembler code. Whilst the effects may be good the lack of proper documentation usually means that you have to know all about copper list programming before the code will mean anything.

As it happens, I've got a book called *Program Design On The Amiga* being published this month

LISTING BREAKS

Because of the width of the magazine's columns, we occasionally have to break listings across two or more lines. Where this has occurred, and you should enter two or more lines without a [Return] between them, we have used the following symbol: ↵

(by Kuma Software). Believe it or not, chapter 19 contains a detailed example of copper list programming using C. I wouldn't recommend you buy it just for that one chapter, but it might be worth popping down to your local computer shop for a quick browse.

As far as your starting point program ideas go, we ought to explain what it is you are trying to do: from the look of your early suggestions you want to locate and modify the Workbench screen's copper lists and so add some effect to the standard display. The good news is that you are clearly on the right track as far as the general program framework is concerned. The bad news is that you've still got some way to go.

There are plenty of ways to get the address of the Workbench screen, but a call to OpenWorkbench() is probably the simplest way to get the address you need. In theory, it is dangerous to use this address directly because another program could close and then re-open the Workbench (this would invalidate the pointer). In practice, and certainly for experimental purposes, you'll be able to regard the Workbench screen pointer as stable and useable (all other Workbench hacks do).

You can get the ViewPort pointer from the screen like this...

```
global_viewport_p=↵
&global_screen_p->ViewPort;
```

It's best to check the UCopIns field. If this is zero it is safe to allocate

continued on page 46

JARGON BUSTING • JARGON BUSTING

Copper – The Amiga's graphics co-processor. It can be instructed to change the parameters of the display as it is drawn on the screen, so allowing screens of different modes to be visible at once, or rainbow effects whereby many more colours can be seen than would normally be permissible in a given screen mode.

Genlock – A way of slaving one video source (eg Amiga) to another (eg video tape) in order to synchronise their signals to allow stable wipes, mixes and other effects including overlay between the two sources.

RGB – Red Green Blue – a standard for video signals that provides better quality than composite or radio frequency signals.

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some memory and create your own additional lists using CWAIT(), CMOVE() and so on. Having done that, you set the UCopIns to point to your newly created copper list and force the system to remake and use the additional instructions. There isn't enough space to give you a complete example, but here's a rough sketch of the sort of code you'll be involved with:

```
if(global_viewport_p->         ↵
UCopIns==NULL)
   { /* NO LIST PRESENT - SO
TURN EFFECT ON */
   c=AllocMem(12L,MEMF_CHIP|↵
MEMF_PUBLIC|MEMF_CLEAR);
   CINIT(c,240L);
   for (j=0;j<255;j=j+10)
          {
          /* this loop
creates a copper list that
forces a variable-intensity
colour into the background
register (colour register 0)
*/
          (j/15) % 2 ?         ↵
BlueColour-- : BlueColour++;
          CWAIT(c, j, 0L);
CMOVE(c,custom.color[0],       ↵
BlueColour);
          }
   CEND(c);
   global_viewport_p->          ↵
UCopIns=c;
   MakeScreen(                  ↵
global_screen_p);
   RethinkDisplay();
   }
   else
   { /* LIST PRESENT - SO
TURN EFFECT OFF */
   c=global_viewport_p->        ↵
UCopIns;
   global_viewport_p->          ↵
UCopIns=0;
   MakeScreen(                  ↵
global_screen_p);
   RethinkDisplay();
   FreeCopList(c->              ↵
FirstCopList);
   FreeMem(c,12L);
   }
```

The purpose of the second (else) set of instructions is to remove and release the user copper list. This allows a toggle effect to be implemented: the program which turned the effect on will, on re-running, cancel the effect. Hope the above ideas help! ***PAO***

MOVING PICTURES

I am currently looking at carrying out a project which needs a number of simple black and white line drawings. Since these already exist in printed form, it would be convenient to scan them in rather than draw them from scratch. I do not have a scanner, but I do have access to a PC with a MicroTek MSF 300G scanner attached. This appears to save picture files with either .TIF, .PCX, or .EPS extensions.

Would it be possible to transfer these picture files over to my Amiga in a similar way to ASCII text files (for which I use *MessyDOS*)? If so, what software would be needed, and is there anything in PD?

Peter Brown
Tetbury
Glos.

The best way to do this is to use ASDG's *Art Department Professional* (£163.43 from HB Marketing ☎ 0753 686000 or Silica Shop ☎ 081-390 1111).

If you want to take the PD route, then your best bet is to get *GIFMachine*, on Fred Fish disk 458. In order to use this, you will also need a PD PC program to convert its graphic files into GIF format (GIF is a standard format used for transmitting pictures across electronic mail systems).Having converted the pictures to GIF format, you will need to transfer the files to the Amiga via *MessyDOS* before *GIFMachine* can have its wicked way with them. ***CR***

VIDEO CLASH

I am expanding my current system to an A1500 complete with 105Mb hard card, multisync monitor, flicker fixer and 68030/68882 accelerator with 4Mb 32-bit RAM (68040 if available when I have enough cash).

I have been informed that the Microway Flicker Fixer ties up the video expansion slot when installed, thus negating the possible insertion of a 24-bit colour board or genlock. Is there any way around this problem?

Also, you said in a previous issue that the Microway product can handle all interlace modes with a resolution of about 700 pixels. I've read that the 24-bit colour board handles resolutions way over 1000 pixels. Is this a problem?

What sort of power drain will there be on an accelerator with a belly full of 32Mb? Has the A1500 got enough muscle to supply the goods considering what else I'll have connected to my system?

While I'm on the subject of enhanced chip sets, is the new chip set from the A3000 allowing you to access 2Mb of Chip RAM available for the A1500/2000?

Finally, how compatible will Kickstart 2.0 be with existing software? I have seen boards that will allow you to switch between three Kickstart ROMs. Are these any good? When will Kickstart and Workbench 2.0 actually be available for the A1500?

Stevie Dux
Lancashire

Firstly, the Flicker Fixer sits in the video slot. As it stands the Flicker Fixer is not compatible with genlocks, so you must either disconnect the monitor from the card when using a genlock, or you should look at another de-interlacer card. As for 24-bit cards, you are a bit mixed up. You will not be able to have the flicker fixer and the 24-bit card connected together. You can't de-interlace output from the 24-bit cards. Your options for 24-bit graphics include the Harlequin board (which fits in a standard Zorro II slot and not the video slot), or the Ham-E and Colourburst, which are external boxes. Whichever way you go you will either need to switch monitors or have two screens.

I wish I could tell you from first hand experience how much power 32Mb of RAM takes up. I've got 14Mb and I thought that was a bit greedy. The card will take 1Mbx4 chips to give 32Mb, a total of only 64 chips for 32Mb, so the power drain should not be a problem.

Meg-A-Chip is available from Bytes 'n' Pieces (☎ 0253 734218), this will give you 2Mb of Chip memory in your Amiga 1500 for £250.

Kickstart 2.0 has been around with developers now for two years; I can't think of one professional package off the top of my head that doesn't run under Kickstart 2.0. As most games ditch the operating system totally, hardly any of them notice the difference either. In my opinion it's not worth keeping 1.3 Kickstart, unless you're a programmer who needs to check programs for 1.3 for compatibility. Nobody knows whether these Kickstart switcher boards will work with Kickstart 2.0 because the chips aren't available yet. Don't buy one until the chips are available and you get a guarantee it will work with the new Kickstart ROM.

Workbench and Kickstart 2.0 may be out by the time you read this. Developers are now starting to receive the upgrade packs, so it is a matter of weeks, not months, before launch. ***JR***

STICKING NOTES

I am running *Music-X 1.1* on an expanded A500 using a D50 as the master keyboard and several expander modules connected via a MIDI THRU box.

JARGON BUSTING • JARGON BUSTING

Flicker fixer – An add-on card that removes the annoying flicker from the Amiga's display when in interlace mode and the visible scan lines when in the non-interlace mode.

Interlace – Interlace is a method used to double the apparent vertical resolution of the monitor by alternately refreshing the screen at a slight vertical offset, thus squeezing an extra line between each of the lines of a non-interlaced screen.

MIDI – Musical Instrument Digital Interface is a standard devised by electronic instrument manufacturers, allowing a number of synthesisers to be controlled by a single keyboard or sequencer.

24-Bit Graphics – Normally, the Amiga uses between one and five bits (binary digits) to store the colour of each pixel (picture element) of a display. This means that between two and 32 colours can be displayed. Hardware add-ons are now becoming available which use 24 bits per pixel, giving a possible 16.7 million colours.

Sequencer – A piece of software on a computer (or sometimes built into a keyboard) which stores musical scores and transmits this information in real time via MIDI to synthesisers which will then play it. Some sequencers have the facility to receive and memorise MIDI information from a music keyboard so that music can be entered 'live' instead of note by note.

Shell – A method of communicating with the Amiga's operating system via the keyboard rather than the more usual mouse and windows method of Workbench.

Speak – An AmigaDOS device, accessed from the Shell, that causes the Amiga to use voice synthesis to verbalise whatever is sent to it.

When playing (but not on playback) I quite often trigger extraneous notes which sometimes, but *not* always, stick on. I have tried changing the MIDI interface and all the MIDI leads, but the problem still occurs. I don't think it is a case of 'MIDI overload', as it often happens with a single note.

Could it be that there is a problem with the port on the Amiga or perhaps the MIDI OUT of the D50? Which MIDI interface do you consider to be the best (I am prepared to try another)? Have you heard of others experiencing this type of problem?

Steve Carter
Oxfordshire

These are not easy problems to deal with. It would have been nice to have more details of your equipment, the wiring configuration used, and the fault itself. Do the sticking notes affect all modules at various times, or is the problem related to a particular unit?

You may find that the problem turns out to be due to a combination of causes. Presumably you've got the D50 set to local off and will be driving all sound circuitry using the sequencer's echo thru facilities. It wouldn't be the first time that small bursts of high-density MIDI data from a touch sensitive (and aftertouch generating) keyboard, plus a bit of signal degradation from a poor/faulty thru box, have caused problems.

Basically, you should be looking to eliminate all possibilities, so another thing that is worth trying is to disable the Roland D50's after-touch transmission – after all it is just possible that even short bursts of D50 generated high-density messages are to blame.

Try setting two modules to the same MIDI channel and see if you can produce a note that sticks on both modules at the same time – if you can that would suggest that the fault lies in the D50/Amiga/*Music-X*/interface or thru box areas rather than being an expander-related problem.

Having done this experiment, repeat it with one sound module and see, still using the thru box, if you can produce a stuck note. If a note sticks, repeat the test without the thru box. If the fault stops occurring you'll know that the thru box is to blame.

If it is purely a thru box fault then you should be able to duplicate it without the Amiga/sequencer. Remove the Amiga/*Music-X* components of the system, ie. drive your modules directly using the D50 and your thru box. Try the same types of experiments again and see what sort of results you get. If you can borrow another Amiga, and another sequencer (preferably not *Music-X*), you'd be able to tell very quickly whether the fault is related to either the computer or the sequencer package.

Remember that a thru box doesn't reduce MIDI traffic, it basically sends a copy of everything it receives at its MIDI IN port to all of its MIDI OUT ports. If, by some chance, you find that the problem does turn out to be an expander related MIDI clogging problem, you may need to use one of the dedicated routing/filtering units that are nowadays available. I'll be honest though... I have *never* encountered a situation where filtering has been unavoidable! You haven't actually said how your thru box is used. If you've only got a 2/3 way split, and have got some of your expander units linked in series, then it is just possible that it's the units at the end of the chain that are to blame (they'll be receiving a poorer quality signal). If this is the case you might find that changing the chaining order might help (some pieces of MIDI equipment can cope better with high-density throughput than others).

All this leads us firmly into the world of 'suck it and see' fault finding. At the end of the day, you've really got to have the equipment in front of you to make any real fault-finding progress.

By the way, yes, these sorts of problems *do* crop up from time to time. It is not something however which you should regard as a fact of MIDI life... I regularly use my Amiga (with Dr T's *KCS*) with chains of five or six sound modules/ drummers/ delay-units and so on. Most of the time I don't bother with thru boxes (more gear to pack up) but even with full arrangements pumping through them I have no problems at all. Believe me – even if your problem did turn out to be a hardware fault on your particular machine (which I very much doubt) there is nothing inherently wrong with the Amiga's serial port design and, now that good Amiga MIDI software is beginning to arrive, the last thing you ought to do is ditch your Amiga.

As far as MIDI interfaces go – all the ones I've ever used (probably about a dozen different types) have been OK but the one I actually use is made by Rainbow Electronics. The reason has nothing to do with the electronics, it's just that it is convenient. The Rainbow interface is a MIDI-port/serial-port switchable, internally fitted, model (it fits into the back panel of the A2000). ***PAO***

SPLITTING IMAGES



I wish to make up a Y connector to split my Amiga RGB output to both a genlock and a 14" Sony monitor. The cable must have a 23-pin D socket for the Amiga output and two 23-pin D pin connectors for the split outputs. Could you illustrate the wiring for me?

Bill Lawrence
Bromley
Kent

Unfortunately, you don't mention what kind of genlock you are using. I assume from your requirements that there is no RGB pass through on it? Sadly, I would say that you will probably achieve very poor results on both the monitor and the genlock if you split the signal like this. A possible alternative solution (which will probably produce better quality than splitting the RGB) is to take the video out from your video recorder and run that to the Sony monitor, using an adaptor cable if necessary, whilst still running the Amiga RGB to the genlock. By doing this you will be able to monitor the Amiga and the video and still have maximum genlock quality. ***GW***

VERBOSE SPEAKER



I have been trying to make my Amiga read documents prepared using *Platinum Works!* with the 'speak' command. These documents are stored on a disk I named 'Works!'. But every time I try to select one document (for example, 'Keep_Fit'), it reads the whole disk including the Trashcan and all the infos. I have tried all sorts of commands, such as:

```
copy df1: Works!/Keep_Fit
to↵
SPEAK:
```

but nothing I have tried will read just one item.

Les Rushbrook
Stevenage
Herts.

The problem lies not in the speak command but in your use of disk names. Firstly, there should be no spaces between the 'df1:' of the command and the filename. Secondly, you can either refer to the disk by name ('Works!'), or by the drive it is in ('df1:'), but not both. To get the desired effect, try:

```
copy df1:Keep_Fit to SPEAK:
```

or

```
copy Works!:Keep_Fit to      ↵
SPEAK:
```

Note that when referring to the name of the disk you must use a colon. A slash symbol is used only for referring to files within a directory on a disk. ***CR***

BREAKING INTO C



I am currently making the first steps towards trying to learn how to program in C. Consequently, on many occasions I have created programs that although they run from the Shell, are impossible to stop. When this occurs I effectively have an open Shell that cannot be closed.

Such programs obviously take up valuable processor time, and my question then is this: is it possible to halt such processes?

At work I use UNIX Systems extensively. On these there are two commands that are useful in such circumstances, namely 'ps' and 'kill'. The 'ps' command is used for listing processes that are currently running along with their process ID number, and the 'kill' command allows you to halt the process associated with a given ID number. Are there equivalent Amiga commands or Amiga PD programs that can do the same type of thing?

Nicholas Murray
Somerton
Somerset

There is a command called 'status' that allows you to list the processes running from a CLI/Shell window. Processes are numbered and the command also allows individual processes to be examined in more detail.

As far as stopping programs is concerned, this is the situation: many programs launched from a CLI/Shell window do recognise the break sequence ([Ctrl]-[C]) and compilers, such as *Lattice/SAS*, support the automatic inclusion of the necessary code. Programs started using 'run' however will not normally have their own console but a 'break' command does allow a break signal to be transmitted. You'll find all of these commands documented in the *1.3 Enhancer Software* booklet (which probably came with your machine), in the *AmigaDOS Manual* (Bantam Books), in *Mastering AmigaDOS 1&2* (BSB Books) and in a number of other publications.

Taken together, all this sounds quite good, but it is more useful for stopping properly running programs than stopping programs which may have got themselves into unbreakable loops or which are slowly running amok and overwriting important system memory locations (or doing nasty things outside of their own memory space).

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Because of this potentially dangerous latter situation, my own view is that, on the Amiga, it is usually inadvisable to assume that the O/S is intact after an experimental program has failed to stop.

On the PD side there are a substantial number of task/process related utilities floating around. I would advise you to contact a few PD libraries and see what's on offer at the current time. ***PAO***

SHRINKING SCREEN

I am having a problem with my newly-fitted Commodore 2320 flicker fixer and NEC Multisync 3D monitor. When used in the 'normal' mode, ie no flicker fixing, the screen display is OK (but not the scan lines, yueck!!). But when I use the flicker fixed output the picture width is greatly reduced and remains squashed no matter how I alter the width control.

Is there any way to get a full width screen by adjusting some undocumented controls on either the monitor or the display card? Presently I might as well be using a 12-inch screen rather than the 14-inch one I have, as the picture is so much smaller than it should be!

Stuart Davis
Eastbourne
East Sussex

I've checked up on this and apparently this is not a fault. A border is present because multiscan displays tend to be of lower quality towards the edges and are thus 'masked' off. Users of other systems such as Apple and IBM have got used to this 'problem'. Amiga users are going to have to as well, as it is unusual to find multisync monitors which allow the display width to be adjusted to lose the borders. There is apparently also a problem with standard Denise chips which causes the top and right borders of such screens to quiver slightly. The new ECS Denise will cure the right-hand problem but not the one at the top. ***GW***

KICKSTART UPGRADES

I have recently bought a second-hand Amiga 500 with Kickstart 1.2. What is the advantage of version 1.3 over 1.2? What is involved in the upgrade? Is it just a couple of disks or is plugging in a new chip necessary? Am I better off waiting for version 2.0 to be released, and if so how do I upgrade to that?

T Holland
Grantham
Lincolnshire

The only visible change in the 1.3 Kickstart, apart from a few minor bug fixes, was the addition of auto-booting capability for hard disk drives, so if you do not have a hard disk (or don't intend upgrading just yet) there is little point in upgrading. The upgrade to Kickstart 1.3 is a simple matter of changing a single chip and can be performed by a good technician in under 30 minutes.

Officially, there is no upgrade planned to replace Kickstart 1.3 with Kickstart 2.0. The ROMs are much larger, something like twice the capacity, and therefore cannot be popped into place without extra wiring. No doubt it will happen eventually, but the upgrade will probably be done through third-party hardware dealers and not Commodore. We'll just have to wait and see. My advice is to sit tight but don't hold your breath yet... ***MS***

USING LIBRARIES

I use the *DevPac 2* assembler and something is baffling me. When I include a library (let's use DOS as an example) I cannot see where the subroutines are! When I examine the files DOS.I and DOS_LIB.I all I see are the CALLDOS macros and equates for the subroutines, but no sign of any instructions. DOS.LIBRARY does not exist on my disks, yet the variable DOSNAME is declared as short for DOS.LIBRARY. I can't find the code anywhere. It is annoying when my CALLDOS commands work and I can't see why or how!

Also, I am having difficulty disassembling an executable program to disk. I first load a program into *Monam* via [CTRL]-[L] and then I press Help to see where my program is in the memory and – do they give you a simple start and end address of the program? No, they give you the address of various bits and pieces (hunk lists, symbol tables, etc.) that I cannot make head nor tail of. Could you please explain?

Neil Smith
Powys
Wales

The DOS library is one of a number of libraries which are ROM based, so it's not surprising that you cannot find it on disk. The appropriate library structures are initialised at boot-up time and the details are therefore already present in Exec's library list. Your program, or the start up code which you tag onto the front of your program during linking, does however have to open such libraries but, since the OpenLibrary() call finds the ROM based libraries already in the library list, it never has to resort to asking AmigaDOS to search the LIBS: assigned directory for them.

As far as the disassembling of executable programs is concerned, there is often *no* simple start and end address. The hunks making up large programs are scatter loaded (bits of code and data are placed wherever there is a suitable amount of memory). The loader adds link instructions automatically so the program, though segmented, runs as if it were placed in a contiguous block of memory. *Monam* then is telling you where the various sections were placed as they were loaded. ***PAO***

PICKING A GENLOCK

Can you advise me on which genlock offers the best quality and features? I have opted for either the Rendale 8802 or the Rocgen (which has a fader control). I want to add titles, credits and logos to pre-recorded video footage.

Do all 2Mb expansion boards require the startup sequences of commercial software to be altered so that the extra memory can be accessed?

Chris O'Brien
Hammersmith
London

The Rocgen fader is useful for extra creative control, though the Rendale offers better picture quality and passes through the RGB signal so that you can use your Amiga monitor properly if you wish. Beyond that the choice is purely personal. I would also recommend that you think about adding more memory to your computer (1 or 2Mb minimum) as most of the graphics and titling software now available will very quickly eat into your 512K, leaving hardly any scope for animated logos, lots of colours and so on.

As far as I know, there should be very little reason to change startup sequences unless they don't recognise the RAM expansion. Most good software should not have this problem. Otherwise you will have to add a command to run *FastMemFirst* in the startup sequence. ***GW***

PRINTER TO PASTURE

I have an old Seikosha GP100-VC printer which I used with my Commodore 64. It has a 6 pin DIN socket. Does an interface exist which will allow me to connected it to my Amiga 500?

Stu
Margate

I can't find anyone who does an interface for CBM 64 printers. I know a long time ago I saw a

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JARGON BUSTING • JARGON BUSTING

Assembler – A program which converts an assembly language program written in words (well, almost) into the machine code numbers that the Amiga's 68000 processor understands. Writing programs in assembly language ensures that the best possible speed and memory efficiency is gained from the machine.

Disassembler – A program that does the reverse of an assembler – it converts machine code numbers back to assembler mnemonics, aiding programmers who want to see how a program works or, more likely, see why a program they have written doesn't work.

Libraries – The Amiga has many special features, and programs are already present in the operating system to make use of these features. These programs, or library functions, may be used by applications programs, obviating the need for each programmer to write a similar set of routines.

Kickstart – The most basic and central part of the Amiga's operating system, held in ROM so that it is immediately present when the machine is switched on. A1000's have Kickstart on a floppy disk meaning that on power up this disk must be inserted before the Workbench disk.

ROM – Read Only Memory permanently stores essential programs, such as Kickstart and many of the library routines, even without power. No new information can be written to ROM, hence the name Read Only.

Startup-sequence – A program which is executed every time the Amiga is switched on and after every reset. It sets up the system so that it is usable from Workbench, and may be customised by those who have unusual hard or software requirements.

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product which allowed you to connect an Amiga to a C64 printer using the 64 as an interface, but I have not seen this mentioned for years. ***JR***

NORTHC RESCUE II

After using the Amiga for two years with commercially supplied software on video and music work, I decided to dig deeper. The local PD library supplied *NorthC* and the instructions said everyone would be able to write this simple program, so I tried:

```
#include <stdio.h>
main()
{
  /* easy as pie */
  printf("\a\aHello ↵
World/n");
}
```

which for me compiles to A68K source code thus:

```
  ;hello.c
  SECTION  NUM1, CODE
  XDEF     _main
_main:
  bra      L1
L0:
  move.l   #L3, -(sp)
  jsr      _printf
  add.w    #4,sp
L2:
  unlk     a6
  rts
L1:
  link     a6,#-0
  bra      L0
  SECTION NUM2, DATA
L3:        DC.B $7,$7. 'Hello
Wor'
  DC.B     'ld', $a
  DC.B     0
  END
```

But when assembled this throws out an undefined symbol error _printf, which makes me fall at the first fence without a clue as to why. Will all newcomers be welcomed to the *NorthC* language in this way or do I get the *classic clanger* award?

Steve Stainton
Sheffield

You are obviously fairly happy with the idea of creating/editing, compiling/assembling and linking programs, which is why you've opted for carrying out the various stages separately. Most *NorthC* newcomers however will have compiled their first examples using the automated cc command, the one which in the case of your hello.c example would take the form:

```
cc -ohello hello.c
```

In fact this would have worked without problem and the cc program would have compiled/assembled and linked your program automatically, just as the *NorthC* example notes indicate.

I suspect that the reason you opted for using the compiler tools separately is that you are interested in seeing what is happening at the various stages – after all, being able to view and list the intermediate assembler code is extremely useful for getting an overall appreciation of what is happening at the 'nuts and bolts' code level.

The good news is that (as I'm sure you know) there is nothing wrong with your C code, nothing wrong with the generated assembly code, and nothing wrong with your basic approach. The error you've got about the undefined symbol _printf arises like this: when the compiler sees a function call reference (in this case a reference to printf() which is a standard library function) it tags an underscore on to its name and, amongst other things, generates a subroutine call. You've no doubt recognised this as the jsr _printf instruction in the resulting assembler code.

The bad news is that the assembler doesn't know about C and it doesn't know that _printf is a reference to a C library function. Because the assembler cannot resolve this reference it throws it out as an error.

Now in the case of your example you could 'tweak' the assembler code by adding an XREF _printf statement to it, but this problem is obviously going to crop up with all C code that uses library functions, so this tweak-as-you-go approach is not a practical solution. What is needed is a means of telling the assembler that *all* unrecognised references should be regarded as external references which will be resolved at a later time.

There appears to be an *A68K* assembler flag, -g, which does just this, but for some unknown reason it isn't documented in the *NorthC A68k* disk manual. *NorthC* generates this -g flag when invoking the assembler and if, when you manually invoke the assembler you do the same, ie use this sort of scheme:

```
a68k -g -ohello.o hello.s
```

then everything will be fine.

When you then link the object code produced, the linker will resolve those outstanding function call references (providing of course it can find them in the specified libraries). ***PAO***

HEY BRO'

I have a Brother M-1109 printer to which you can download character sets so that certain characters can be re-defined. I have been able to do this in the past with a Sinclair ZX Spectrum. I have tried to use the program I used on the Spectrum on my Amiga 500, but it will not work. Help!

Also, could you tell me if it is possible to redesign the character set that the *Wordworth* word processor uses and output these characters to the printer as they are shown on-screen?

Antony Terleckis
Horsforth
Leeds

I assume you are using Amiga BASIC to send your printer control codes. It doesn't tell you this in the manual, but you can't use the LPRINT keyword to send non-ASCII characters like the CHR$(27) escape code. Instead, you must open a stream to PRT: (the printer device) and send codes to the printer via that stream. For example:

```
OPEN PRT: FOR OUTPUT AS #4
PRINT #4,CHR$(27);":"
```

Wordworth uses standard Amiga bitmap fonts, so you could use *Fed* on the Extras disk to create a font, or alter an existing one, and use that with *Wordworth*. If you use the graphics mode output, *Wordworth* will send the exact character you see on-screen to the printer. ***JW***

DRIVING DESIRES

I recently purchased a second-hand 3.5-inch external drive. There are no markings as to the identity of the manufacturer in or on the case. The original NEC FD 1037A drive unit was faulty due to a broken flexi-ribbon to the heads. I have replaced the drive unit with a TEAC FD 235HF.

If I run the system without a disk in DF1: and the enable on, I get a DF1:BAD icon. After a program has been loaded from df0, if a disk is then inserted into df1: the system does not read any data from df1:, nor does it recognise a disk in df1:. If a disk is inserted in df1: prior to loading the main program in df0: then all seems to work OK – the computer is able to read and write to df1:. However, if the disk in df1: is changed then the system does not recognise the new disk as it still thinks the original disk is in df1: – it does not do the periodic search when empty as does df0:. Can you help?

D Hardy
Lincoln

The drive is not sensing disk changes. I don't have any technical information for that drive model here. I suggest you talk to the dealer who supplied the drive, or, failing that, TEAC direct. ***JR***

SLIDE MAKER

I am a freelance retouching artist and illustrator, and I need to know if there is a way for me to make transparent slides. If there is, what equipment would I need?

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JARGON BUSTING • JARGON BUSTING

ASCII – American Standard Code for Information Interchange – the storage method commonly used for text files which enables data to be exchanged between different computers.

Linker – A program which joins together the various segments of code produced by a compiler, along with any relevant library routines, and produces a finished, executable program.

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Attention Amiga A500 Owners

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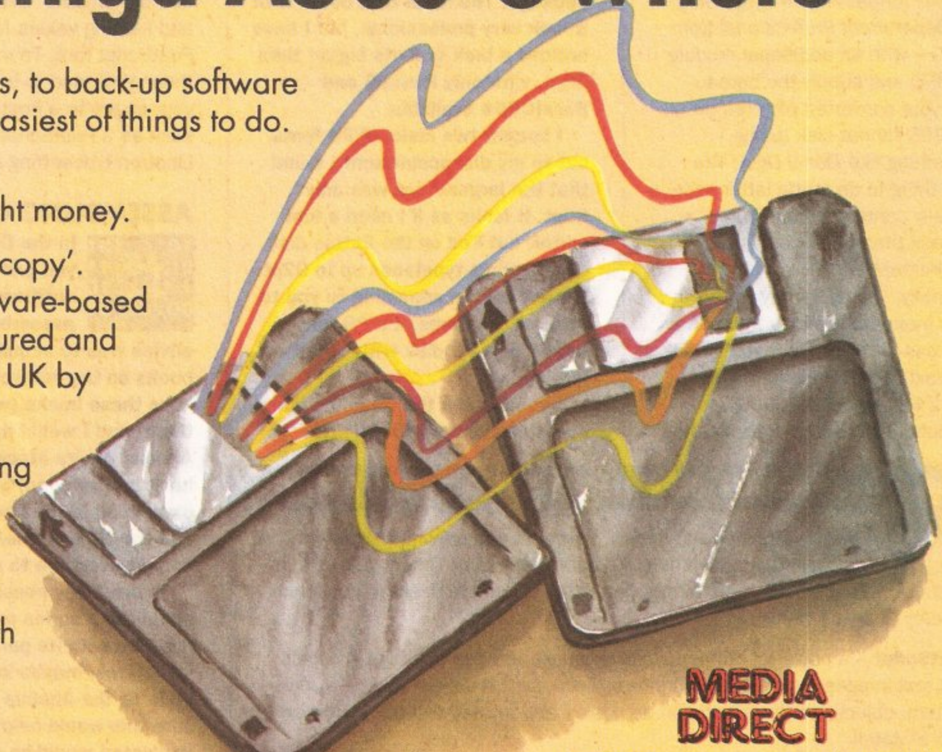
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Is there an inexpensive way to retouch prints or transparencies by computer, and would the results be usable by the print trade? I've read about 'Kodak Diconix' and 'Corporate Components' A4 Scan Plus machines. Would they do the job and would they fit an Amiga?

GH Brooks
Bramall
Cheshire

In answer to your first question, and presuming that you want to use Amiga graphics to make transparent slides, yes there are ways. The simplest is to take pictures of your Amiga screen output – on as good a quality monitor as possible, using a tripod, cable or timer release, exposure times of 1/30th second or smaller, in a darkened room, using good quality transparency film with as high a speed (ASA 200 +) as possible. Some of the pictures you see in *Amiga Shopper* have been produced like this.

A second way is to save the graphics file to disk and then send it to a bureau to be output directly to a slide maker. There are a number of such bureaux around and you'll find adverts for them in many different types of magazine – from computer to audio-visual, printing and graphics. It would be easier if you used one which used Amigas, as otherwise you would have to convert your Amiga images to a PC format like TIFF (by using *Art Department Professional* from ASDG – with an additional module for TIFF) and supply the bureau with your converted pictures on an MS-DOS format disk (using something like *Dos-2-Dos*). The best thing to do in the latter case is actually contact various bureaux and ask them their costs and requirements.

Finally, you could buy your own slide maker, but prices for such an item can be high. For instance,the Polaroid CI 3000 Digital Palette, with 24-bit colour and 2000 line resolution, will set you back almost £4000 + VAT. In addition you will need extra software and a driver for the Palette. If you're curious you could contact Alternative Image on ☎ 0533 440041, since they are a Polaroid agent and provide a slide-making service.

With regard to the other parts of your question, it seems that neither the Diconix nor Scan Plus will fit an Amiga – so even if they would do the job you would have to find another computer to do it with.

You could certainly retouch transparencies or prints on the Amiga, but they would have to be scanned in at very high quality and then manipulated with a high powered paint and imaging system in order to keep the quality up to that of the original pictures. A standard Amiga certainly wouldn't be up to such a task, as even its best resolution is relatively poor when compared to trannies or prints. But with one of the new graphics boards, lots of memory, an A4 scanner or high quality video digitiser, 24-bit paint and image processing software and a hard drive it may just be possible. But then again, it all depends on the final quality you are happy with – and the length of a piece of string. ***GW***

BIG FONTS

I really like to publish pages on my 1Mb A500 using *PageSetter 1.21* as supplied in the *Publisher's Choice* package. The fonts that come with it look very professional, but I have noticed a lack of fonts bigger than 50pt, with only Paris56 and BaselCB64 available.

I bought two disks of PD fonts, but to my disappointment I found that the largest font was only 22pt. It looks as if I need a font editor, but Fed on the Extras disk only handles typefaces up to 32pt. Therefore I am appealing to you to give me the name of a PD font editor, or a PD disk with +50pt fonts on it.

Secondly, on the *Headline Fonts* disk that comes with *Publisher's Choice*, the Times, Courier, Helvetica and Symbol fonts are prefixed with a 'p' — pTimes for example. Also there are files named Helvetica, Courier, and so on, with a '.metric' suffix. What does this mean?

Philip Lunn
Gateshead
Tyne and Wear

Searching through my Fish Disk lists, the only font editor I can find is on Fish #30, dating back to the very early days of the Amiga. I've asked everywhere I can think of to try and find another, but there simply doesn't seem to be a decent, up-to-date shareware font editor apart from the sort to create 'cut-out' fonts for demo programmers, which is no good to you.

So I asked around for large fonts... and came up with zilch. It seems that most fonts are designed either for programmers to use within programs or for video titling, both of which occupations require smallish fonts. I'm afraid the only thing I can recommend is a £70 commercial package called *Personal Fonts Maker*, supplied by HB Marketing (☎ 0753 686000). Either that or upgrade your old version of *PageSetter* to the newer version, which comes with scalable Compugraphic fonts that can be sized up to 127pt. Again, speak to HB Marketing about the upgrade; it costs about £35.

The 'p' before the font name means that it is a PostScript font, and the '.metric' file contains width and kerning values for that PostScript font. To make use of these you need to be able to output your pages to a PostScript device, such as a PostScript laser printer or Linotron typesetting machine. ***JW***

ASSEMBLING GRIPES

In the October issue you printed a letter entitled *Learning assembler*. Your advice was to acquire certain books on the subject. I already have these books (well, most of them) and I would agree that the Abacus *Amiga Machine Language* book is very good, but it doesn't explain all of the library routines, and the *ROM Kernel Manuals* expect everyone to use C.

Is there any possibility that you could run a series explaining each function with its parameters and structures, maybe in the same style as the Abacus books? I'm sure this would help a great many frustrated would-be coders like me.

Mark Bonshor
Quorn
Leicestershire

Printing explanations of each function along with its associated parameters is unfortunately impractical: it would result in a book as big as the two *Rom Kernel Manuals* themselves. Having said this, we are intending to run further assembly language tutorials, so hang on in there.

The reason that these books expect everyone to use C is, as you probably know, because most of the Amiga's operating system is written in C, a language which is generally acknowledged to be the most suitable for large programs on a machine such as the Amiga.

Both *RKM*s do actually include information for assembly language programmers. This largely consists of the register conventions needed for each function. For a better understanding of the data structures and so forth, I'm afraid you are going to have to learn a little about C. There is no essential difference between assembly data structures and C structures, except that C enables the programmer to refer to a structure and its constituent parts by name, whereas the assembler programmer must use offsets. A rudimentary understanding of C is necessary to understand the size of the individual parts of structures. This sort of information can be found in any book on C. I recommend Kernighan and Ritchie's *The C Program Language*, published by Prentice Hall. ***CR***

CENTRING THE SCREEN

Can you explain why the picture on my TV screen (via the modulator) is not central when displaying games that have been loaded? The picture aligns with the right-hand side of the screen and leaves a 1" border on the left. However, I can centre the picture OK when I use the Workbench Preferences.

Is this normal or can the picture be aligned in the games mode?

AE Beales
Bures
Suffolk

As you rightly say, Preferences can be used to set the screen position. Furthermore, you may have realised that if you adjust the screen position, save the results and then re-boot the computer with the newly saved disk then the screen position will match the one just set.

With any software which requires the computer to be booted with a program disk (including many games and commercial titles) Preferences will be reset to the parameters saved on that disk by

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JARGON BUSTING • JARGON BUSTING

Font – The group of letters, numbers and special characters that comprise one variation of typeface, eg 12pt Times, 12pt Times Bold, 12pt Times Italic. Sometimes (mistakenly) used in desktop publishing to refer to a type family.

PostScript – A powerful mathematical language used to describe graphics and text images to compatible printers. Because it does not rely on a pixel system, objects so described can be scaled and rotated without distortion or loss of detail.

Structure – A class of data storage in C whereby a group of primitive data types – for example, integers and reals – are joined together in a particular order to form a user-defined type.

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HARWOODS AMIGA PRO-GEN



PROFESSIONAL QUALITY GENLOCK FOR COMPUTER AND VIDEO MIXING, AT A DOWN TO EARTH PRICE!!!

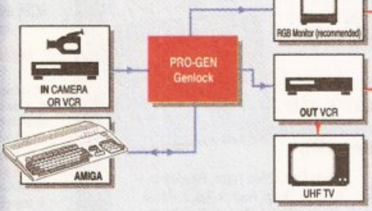
PRO-GEN Amiga Genlock

The Pro-gen AMIGA Genlock allows you to mix your Amiga display with any PAL video signal whether it is from a VCR, Laserdisk player or a Camcorder. In fact any item of video equipment which outputs a PAL composite video signal.Combined with the Amiga computer the Pro-Gen gives you the facilities of a special effects & video titling suite. Take your own films & give them a professional look by OVERLAYING TITLES or by SUPER IMPOSING YOUR OWN GRAPHICS created in packages like Spectracolor or Deluxe Paint. Pro-Gen is supplied with Oxxi's Spectra-color paint & animation package.

FREE

In Spectracolor every drawing tool and animation control is at your finger tips - over 50 tools in the fast menu Toolkit, plus point and click access to all 4096 colours, with independent right and left mouse button colours & modes. Add automatic animation generation easy mouse controls for all functions, and the ability to paint with multi-page animated brushes, and you've got a powerful tool for artistic expression. With animation controls this easy it's simple to put your ideas into motion. Forget co-ordinate systems and reference numbers just move objects with the mouse in this intuitive and friendly graphical environment. Spectracolor supports both ANIM & IFF file formats, and all the video modes of the Amiga, including HAM! (Spectracolor requires min. 1Mb. memory)

How it works:



STOP PRESS

PRO-GEN... NOW INCLUDES A VERY VERSATILE MULTI COMPONENT VIDEO TO GENLOCK CONNECTING CABLE KIT. THIS ALLOWS PRO-GEN TO BE USED STRAIGHTAWAY WITH MOST POPULAR VIDEO EQUIPMENT, WITHOUT THE NEED TO HUNT DOWN THE CORRECT CONNECTING CABLES. THIS KIT CAN ALSO BE USED TO CONNECT IN OTHER WAYS... eg. VCR TO VCR etc.

A KIT TO START YOU OFF RIGHT FROM THE MOMENT YOU OPEN THE BOX!!!

PRO-GEN & Spectracolor ONLY £129.95

Mode Switch-box for Genlocks

Features Include

- -Compatible With The Pro-Gen And Rendale 8802
- -Supplied With Genlock Extender Cable Worth £9.95
- -Switch-box Switches Between Foreground, Background, Video And Computer Modes.

£29.95

Finance terms are available (subject to status) for most products; please see our ordering panel at the end of this advert for full details

AMIGA STORAGE DEVICES

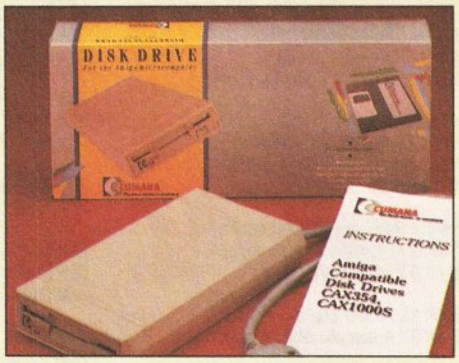
Commodore A590 20Mb HD

Features Include
- ☆ Connects to sidecar bus on left hand side of Amiga A500
- ☆ Autoboots with Kickstart 1.3
- ☆ Sockets For Up to 2 Mb of RAM
- ☆ DMA Access
- ☆ External SCSI Port
- ☆ Complete With Power Supply

A590 Hard Disk Including 512K RAM Only **£299.95**

A590 Hard Disk Including 1 Mb. RAM Only **£319.95**

A590 Hard Disk Including 2 Mb. RAM Only **£349.95**



Cumana CAX354 3.5" External 2nd Disk Drive.
- ☆ Features Include
- ☆ Long connecting cable
- ☆ 1Mb, (880K Formatted) Capacity
- ☆ Enable/Disable Switch,
- ☆ Throughport
- ☆ Access Light
- ☆ Compatible with Amiga 500/1000/1500/2000/3000 and CDTV

£57.95

SUPRA 500XP 52-105Mb HARD DISK DRIVE WITH MEMORY EXPANSION UP TO 8Mb.

Features Include:
- ☆ Capacities of 52/80/105Mb available
- ☆ Connects to sidecar bus on L/H side of Amiga A500
- ☆ Autoboots with Kickstart 1.3, boot enable/disable switch
- ☆ Sockets for up to 8 Mb of FASTRAM with enable/disable switch
- ☆ Autoboots With Kickstart 1.3
- ☆ SCSI Port & Amiga bus pass thru allows other devices to be connected
- ☆ Includes Express Copy hard drive Back-up Software
- ☆ The 52 Mb version powered by your Amiga (High Current Power Supply is only optional).

*High Current Power Supply is required for 80Mb. and 105 Mb versions. Only... **£49.95**

SUPRA PRICES

RAM SIZE	STORAGE CAPACITY 52Mb.	80Mb.	105Mb.
1Mb.	£479.95	*£539.95	*£629.95
2Mb.	£499.95	*£569.95	*£649.95
4Mb.	£699.95	*£749.95	*£849.95
8Mb.	£899.95	*949.95	*1049.95

*Please don't forget to add the cost of Power Supply when calculating price of 80/105Mb. drives

EDUCATION SOFTWARE

DON'T JUST PLAY GAMES WHEN YOU CAN LEARN WITH YOUR AMIGA TOO!

PRIMARY MATHS COURSE - Ages 3 to 12, Complete 24 Programme Course. £21.95

BETTER MATHS - Ages 12 to 16, Higher level to Linear & Quadratic Equations. £21.95

MICRO MATHS - 24 easy to use programs for GCSE ('O' Level) revision or self tuition £21.95

MEGA MATHS - A 9 level step by step tuition course. For mature beginners, 'A' Level studies & Micro Maths users £21.95

MICRO FRENCH - GCSE French tuition or revision course. Covers both spoken & written French £21.95

MICRO ENGLISH - A complete programe of self-tuition up to GCSE standard £21.95

THE THREE BEARS - Ages 5 -10, Develops imaginative thought/reading skills. £22.95

SPELL BOOK - Ages 4 to 6, Developed with the help of a Primary School Head Teacher to aid spelling skills. £17.95

PLAY AND READ - Ages 4 to 9, The complete reading tutor. Part 2 teaches spelling to the beginner at reading. £18.95

AMIGA PERIPHERAL PACKS

TWO GREAT PACKAGES THAT SAVE YOU MORE MONEY!

These two packs are aimed at the user who needs to get a great deal from his Amiga. A superb quality monitor, the PHILIPS CM8833/II has been put with your choice of either the CITIZEN SWIFT9 or the CITIZEN SWIFT 24 printer. You choose, but whichever combination you have the price has been designed to SAVE YOU MONEY. Buying together will save you £££'s!

PERIPHERAL PACK 1-CM8833/II + Citizen Swift 9

Only... **£469.95** With a FREE PEN PAL worth £79.95

PERIPHERAL PACK 2 -CM8833 + Citizen Swift 24E

Only... **£569.95** With a FREE PEN PAL worth £79.95

AMIGA SOFTWARE

Music-X: The ultimate software for professional MIDI sequencing. The software includes a configurable librarian and a synthesiser patch editor. All you need to recreate a song can be recalled from one performance file including sequences, MIDI routing, sync setup, keyboard maps & synthesiser or drum machine patch libraries. **NEW LOW PRICES - £54.95 or just £74.95 with midi-interface!**

MIDI INTERFACE (5 Port): In, Out, Through plus 2 switchable thru'/out. Includes cable. £24.95

AMOS: AMOS allows you to access the power of the Amiga with ease. 500 different commands make AMOS a sophisticated development language. The AMOS animation language allows you to create complex animation sequences. 300 page manual and over 80 example programs £49.95

Amos Add on Modules: (BOTH require Amos prog.)
Amos Compiler Amos 3D

BUY ALL THREE AMOS PROGRAMS FOR JUST **£89.95**

SuperBase 4: Most powerful database available for the Amiga.Combines the ease of use of SuperBase 2 with a versatile programming language so that you can tailor your data to your own specific needs for club/business/library records etc. £229.95

Lattice C: An ideal tool for the C programmer whether experienced or a novice. The best way to create applications for the Amiga.Fully supports Motorola chipset. Nearly 300 functions optimised to help the user write the tightest possible code. Includes screen editor. Most Amiga C books are based around lattice. (Requires either 2 floppy drives OR a hard disk drive) £199.95

Deluxe Paint IV: Latest version of the Amigas first, and still the best, paint and animation package, now including HAM mode. (1 Mb. minimum memory or more recommended) £79.95

Vidi, The Complete Colour Solution: Vidi with RGB Splitter, Frame Grabber & Digitiser. Grabs moving colour video into 16 grey scale frames (up to 16 frames in 1Mb. Amiga) and digitises from still colour video source in up to 4096 colours in less than 1 second! Requires home VCR or video camera for grabbing. Requires video camera or VCR with perfect pause for digitising. Now comes with Spectracolor FREE!!! £179.95

MASTERSOUND: High quality "mono" sampler (best for sampling instruments etc.) £36.95

THE ABOVE IS JUST A SMALL SAMPLE FROM OUR EXTENSIVE RANGE OF THOUSANDS OF SERIOUS, EDUCATION AND RECREATION TITLES.WE CAN'T LIST THEM ALL HERE SO PLEASE CALL US IF YOU CAN'T SEE THE PROGRAM YOU REQUIRE, IT'S PROBABLY IN STOCK!

Pen Pal V.1.3

WORD PROCESSOR/DATABASE

With Pen Pal you can mix text, 4096 colour graphics & data in ways no other w/p can! "It's handling of graphics is unsurpassed: Pen Pal is the only word processor I tested that will automatically wrap text round graphics..

Amiga World, July '90



£79.95

PEN PAL Vers 1.3 WITH 512K Amiga RAM Expansion only...£99.95!

If you're thinking about presents why not buy a Harwoods Gift Voucher (all values available).

Enquiries & Order Line: **0773 836781**

Finance Facilities Available*

Please phone us for information and your personal application pack.

GORDON HARWOOD HARWOOD HARWOOD Computers

ALFRETON DERBYSHIRE

The Closer you look, The Better we look.

*Finance terms are available (subject to status) for most products: please see our ordering panel at the end of this advert for full details

FREE... Fully Tailored Dust Cover with all Dot Matrix Printers

PRINTERS

NEW LOWER PRICES!!!

All printers in our range include the following standard features...

- Standard Centronics parallel port unless otherwise stated for direct connection to Amiga, PC's, ST etc. and come with a:
- FREE CONNECTOR LEAD & A FREE TAILORED DUST COVER!



When you are comparing our prices to others make sure that the same essential items are ncluded eg. Printer Lead, Dust Cover, Postage and VAT etc.

CITIZEN 120D+ 9 PIN MONO - Up to 120/25 cps — £149.95
- Very reliable low cost printer with interchangable interfaces for Centronics/RS232/serial type (C64 etc.)
- Full 2 Year manufacturers warranty

NEW FASTER STAR LC20 9 PIN MONO - Up to 150/38 cps — £159.95
Replacement for our most popular Mono Dot-Matrix at a super low price
- Multiple font options easily accessible from front panel
- Excellent paper handling facilities
- Simultaneous, continuous and single sheet stationery
- 240 x 240 dpi Graphics

CITIZEN 124D 24 PIN MONO - 120/40 cps — £199.95
- 360 dpi - 24 Pin MONO with 3 Fonts
- 8K Buffer - Expandable to 32K
- 3 Fonts, Superb letter quality
- Full 2 Year Warranty
- Feed for labels & multi-part stationery
- Complete paper parking facilities.

STAR LC 24/10 24 PIN MONO - 150/50 cps — £214.95
24 Pin version of the Star LC Series with
- Exceptional letter print quality
- 360 x 360 dpi Graphics
- Additional font cartridges available
- 8 resident fonts

STAR LC200 9 PIN COLOUR PRINTER - 185/40 cps — £209.95
This is the one in our packs!
- 80 Column Dot Matrix
- 240 dpi - 9 Pin COLOUR
- 16K Buffer, 8 Resident Fonts
- Push/pull tractor & rear/bottom feeds
- Reverse paper feeds
- Micro paper feed, Max. paper width 11.7"
- Supplied with colour & mono ribbons
- Paper park with auto single sheet loading
- Programmable from front panel.
- 12 month warranty

CITIZEN SWIFT 9 PIN COLOUR - 160/40cps — £219.95
New super high spec 9Pin colour printer
- 8K Buffer 4 Fonts
- Push and pull tractor built-in
- Feed for labels/multi part stationery
- 240 x 240 dpi Colour Graphics
- Best text quality in our 9Pin range
- 2 Year Citizen warranty

STAR LC24/200 24 PIN MONO - 220/55 cps — £249.95
New Star 24 pin that means business!
- 80 Column Dot Matrix
- 360 dpi - 24 Pin MONO
- 7K Buffer expandable to 39K
- 10 Resident Fonts
- Front Panel Pitch Selection
- Push/pull tractor & rear/bottom feeds
- Reverse paper feed
- Paper park with auto single sheet loading
- Micro paper feed, Max. paper width 11.7"
- Supplied with mono ribbon
- Faster than the old LC24-10
- Extra font cartridges available
- Program from front panel, No DIP switches
- 12 month warranty

STAR LC24/200 24 PIN COLOUR - 220/55 cps — £299.95
Colour version of the LC24-200 Mono but with expandable 30K Buffer.

NEW 24 Pin CITIZEN 224 COLOUR - 160/53 cps — £259.95
Brand New, lowest cost colour 24 Pin printer, anywhere!
- 80 Column Dot Matrix with 4 Fonts
- 360 dpi - 24 Pin COLOUR
- 8K Buffer expandable to 32K
- Easy to use front panel controls
- Push & pull tractor feeds
- Complete paper parking facilities.
- Supplied with mono & colour ribbons
- Full 2 Year Citizen Warranty

NEW 24 Pin CITIZEN SWIFT 24E COLOUR - 180/60 cps — £319.95
Brand New, superb specification colour 24 Pin printer.
- 80 Column Dot Matrix with 7 Fonts
- 360 dpi - 24 Pin COLOUR
- 8K Buffer expandable to 32K
- Easy to use LCD panel controls
- Push/pull & bottom tractor feeds
- Complete paper parking facilities.
- Supplied with mono & colour ribbons
- Full 2 Year Citizen Warranty

CITIZEN SWIFT 24 PIN COLOUR - 160/50 cps — Phone for very special prices!
The ever popular "European Printer of the Year 1990", fully featured 24 Pin colour printer which of course comes with Citizens 2 Year Warranty.

NEW FASTER STAR XB 24 PIN COLOUR RANGE XB24-200 & XB24-250 - 275/80 cps — £399.95 24-200 Colour — Wide Carriage £499.95 24-250 Colour
These NEW top of the range Stars replace the XB24/10 & XB24/15, & offer the best possible quality dot matrix printing
- Exceptional print quality
- 4 x 48Pin super letter quality fonts
- 14 x 24Pin near letter quality fonts
- Buffer: 29K(XB24/200) & 76K (XB 24/250)
- 360 x 360 dpi Colour Graphics
- 12mths on-site warranty (UK Mainland)

HEWLETT PACKARD PAINTJET COLOUR A4 INKJET — £899.95
Our best quality full colour printer at a realistic price
- Parallel/Centronics or Serial RS232 I/F (specify with order, MAC option available)
- For presentation graphics/DTP, CAD and technical/scientific applications
- A full page of colour graphics in 4 minutes (typical)
- Non impact printing, virtually silent, 43dba
- Will print transparencies
- 12 Months on-site warranty (UK Mainland)

STAR LASERPRINTER 4 - 4ppm MONO LASER — New! £749.95
A4 Laser Printer, will connect to PC, Amiga, Atari ST etc.
- 300 DPI, 1Mb. Upgradable to 5Mb.
- Emulations inc: HP Series II, Epson EX800, IBM Proprinter & Diablo 630
- Serial & Parallel Interfaces
- 12month on site warranty (UK Mainland)
- Every desktop publishers dream

STARSCRIPT - 4ppm POSTSCRIPT COMPATIBLE LASER — New! £1099.95
A4 Laser Printer, will connect to PC, Amiga, Atari ST & Apple Macintosh
- As the LASERPRINTER 4 but with Starscript and 2Mb Memory, 49 Fonts and Appletalk.

SEE OUR LIST OF ACCESSORIES FOR BOTH STAR AND CITIZEN PRINTERS, ALL AT COMPETITIVE PRICES!

All the characters Per Second speeds quoted above are Draft/LQ at 10cpi

PRINTER ACCESSORIES

CITIZEN PRINTER ACCESSORIES:

Citizen 120D+ Sheet Feeder	£69.95
Citizen 120D+ Parallel Interface	£49.95
Citizen 120D+ CBM C64 Serial Interface	£49.95
Citizen 124D 32K Buffer	£13.95
Citizen 124D Semi-Auto SheetFeeder	£39.95
Citizen 124D Automatic Sheet Feeder	£79.95
Citizen 124D Printer Stand	£24.95
Citizen Swift 9 Semi-Auto SheetFeeder	£39.95
Citizen Swift 9 Automatic Sheet Feeder	£79.95
Citizen Swift 9 Printer Stand	£24.95
Citizen Swift 9X Printer Stand	£34.95
Citizen Swift 9X Automatic Sheet Feeder	£139.95
Citizen Swift 24 32K Printer Buffer	£13.95
Citizen Swift 24 Semi-Auto Sheet Feeder	£39.95
Citizen Swift 24 Automatic Sheet Feeder	£79.95
Citizen Swift 24 Printer Stand	£24.95
Citizen Swift 24X Auto Sheet Feeder	£139.95
Citizen Swift 24X Printer Stand	£34.95

HEWLETT PACKARD PAINTJET PRINTER ACCESSORIES:

Hewlett Packard PaintJet Black Ink cartridge	£25.95
Colour Ink Cartridge	£31.49
Single Sheet Printer Paper	£17.95
Z-Fold Printer Paper	£15.95
Transparency Paper: Pack of 50 Sheets	£52.95

STAR PRINTER ACCESSORIES:

Star LC-20 Mono Printer Automatic SheetFeeder	£74.95
Star LC24-10 Mono Printer 32K Buffer £67.95	£67.95
Automatic SheetFeeder	£74.95
Star LC-200 Colour Printer Automatic SheetFeeder	£74.95
Star LC 24-200 Mono Printer 32K Printer Buffer	£34.95
Automatic SheetFeeder	£74.95
Star LC 24-200 Colour Printer 32K Printer Buffer	£34.95
Automatic SheetFeeder	£34.95
Star XB 24-200 Colour Printer Pull Tractor	£34.95
Font Cartridges - Styles To Be Announced	£29.95
128K Centronics Printer Buffer	£89.95
Automatic SheetFeeder	£114.95
Dual Bin SheetFeeder	£429.95
Star XB 24-250 Colour Printer Pull Tractor	£34.95
Font Cartridges - Styles To Be Announced	£29.95
128K Centronics Printer Buffer	£89.95
Automatic SheetFeeder	£174.95
Dual Bin SheetFeeder	£469.95

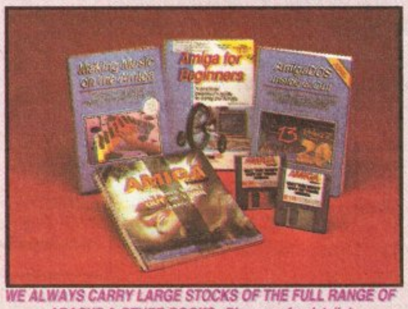


GENUINE CITIZEN & STAR REPLACEMENT PRINTER RIBBONS

PRINTER	PRINTER TYPE	BLACK RIBBON	BLACK RIBBON 'SIX PACK'	COLOUR RIBBON	COLOUR RIBBON 'SIX PACK'
CITIZEN 120D+	BLACK ONLY	£4.95	£24.95	N/A	N/A
CITIZEN 124	BLACK ONLY	£4.95	£24.95	N/A	N/A
CITIZEN SWIFT 9	BLACK/COLOUR	£4.95	£24.95	£16.95	£99.95
SWIFT 24/24E/224	BLACK/COLOUR	£4.95	£24.95	£16.95	£99.95
STAR LC10/20	BLACK/COLOUR	£4.95	£24.95	£6.90	£36.50
STAR LC200	BLACK/COLOUR	£6.95 ZX9	£36.95 ZX9	£12.95 ZX9CL	£69.95 ZX9CL
STAR LC24/200	BLACK/COLOUR	£8.95 Z24	£49.95 Z24	£14.95 X24CL	£74.95 X24CL
STAR XB RANGE	BLACK/COLOUR	£8.95 Z24	£49.95 Z24	£14.95 X24CL	£74.95 X24CL

BOOK SHOP

FOR BEGINNERS & EXPERTS ALIKE



WE ALWAYS CARRY LARGE STOCKS OF THE FULL RANGE OF ABACUS & OTHER BOOKS...Phone us for details!

AMIGA FOR BEGINNERS - VOL. 1 ABACUS BOOKS, £12.95
From unpacking your Amiga to creating your own icons, includes first use of basic and extras disk.

AMIGA BASIC INSIDE AND OUT - VOL 2 ABACUS BOOKS, £18.95
Definitive step by step guide to programming Amiga's in basic.

AMIGA MACHINE LANGUAGE - VOL 4 ABACUS BOOKS, £14.95
Practical guide to learning 68000 assembler language.

AMIGA DOS INSIDE AND OUT - VOL 8 ABACUS BOOKS, £18.45
Guide to Amiga DOS & CLI. NEW Edition inc. DOS v 2.0

AMIGA HARDWARE REFERENCE MANUAL-Addison Wesley, £21.95
Written by technical experts at Commodore Amiga Inc, USA... People who designed your Amiga. Hardware level machine code programming at advanced level.

AMIGA, BEST OF TRICKS & TIPS Vol. 17, £32.95
A complete set of tricks and tips that enable you to do MORE with your Amiga and as simply as possible.

MONITORS & MONITOR TV's

Harwoods stock a complete range of both Monitors & Monitor TV's to give you your perfect solution to the type of display to buy.



PHILIPS CM8833/II — Stereo High Resolution Colour Monitor

NOW WITH FREE...F19 STEALTH FIGHTER!!!

The ever popular 14-inch Philips CM 8833 MkII, is the most versatile multipurpose colour monitor available. Its versatility means you not only get excellent colour graphics & text performance with a wide range of personal computers, but when connected to a VCR or optional tuner, you get an amazing 600 pixel TV picture. It's this 600 pixel resolution, that makes the 8833 essential for the serious user who wants to use his computer for text based applications. With the 8833 MkII, Harwoods give you the complete set up, to get you going straight away... Monitor, RGB picture and Stereo Audio Cables, Tailored dust cover, a full 12 Months on site service warranty, and inclusive of a FREE Superb F19 Stealth Fighter Game!!!

☆RGB/AD, TTL, Composite. Video & stereo audio inputs Can be used as a TV with VCR or Tuner Also as a Video Camera display monitor Retractable stand ☆Twin Stereo Speakers Headphone Jack Socket FREElead for your computer FREE 12 Month on site service warranty.

THE MOST VERSATILE STEREO COLOUR MONITOR AVAILABLE **£249.95**

CBM 1084S STEREO COLOUR MONITOR. Commodore's Own Stereo High Resolution Colour Monitor with... RGB/AI/TTL, Composite. Video/Audio Inputs Can be used as TV with VCR or tuner. Twin Speakers for stereo output Supplied with cables for A500, CGA PC,\C16-64-128. **£269.95**

PHILIPS TV TUNER. ALLOWS ANY MONITOR WITH COMPOSITE VIDEO & AUDIO INPUTS TO BE USED AS A TELEVISION. SUPPLIED COMPLETE WITH AERIAL FOR USE INDOORS ALSO HAS STD EXTERNAL AERIAL SOCKET AND COMPATIBLE WITH MOST MONITORS INC. PHILIPS CM8833 MK I & II, CBM 1081/4, & 1900/1/2. **£79.95**

It's important to remember that most TV Monitors, are still first and foremost televisions, meaning that their average 400 pixel tube display 50% lower resolution than a monitor) cannot be guaranteed to display 80 column text clearly without risking eye strain. If choosing a Television Monitor ensure it has the latest 2000 character tube capability, meaning it can handle the Amigas' 80 characters, by 25 line output clearly.

NEW!!! PHILIPS 15" TELETEXT REMOTE CONTROL 40 CHANNEL MONITOR TV. BRAND NEW SUPERB DEFINITION PHILIPS MONITOR TV. IDEAL FOR AMIGA OR CDTV USERS, GIVING FOR THE FIRST TIME TRUE MONITOR QUALITY FROM A FULL FEATURE TELETEXT TV AT AN AFFORDABLE PRICE!!!. JUST LOOK AT THE FEATURES... Direct Scart Connector for Amiga, CDTV, VCR OR SATELLITE RECEIVER RGB/AD, Composite Video & audio inputs FULL TELETEXT FACILITIES (FOR THIS FACILITY EXTERNAL AERIAL SHOULD BE USED) Headphone Jack Socket FULL TWO YEAR GUARANTEE ☆2000 CHARACTER HIGH DEFINITION FST TUBE SUPPLIED WITH LOOP AERIAL REMOTE CONTROL ☆FREE lead for YOUR computer

IF YOU WOULD LIKE THE MONITOR TV IN OUR PACKS 2, 3, POWERPRO OR WITH ONE OF OUR PERIPHERAL PACKS TO REPLACE THE 8833, PLEASE SIMPLY ADD £20.00 AND STATE YOUR PREFERENCE WHEN ORDERING.

ONLY... **£279.95**

AMIGA ACCESSORIES

KCS POWERBOARD IBM PC EMULATOR ☆Hercules, CGA & Monochrome Video Support, Supports Both 3.5 Inch & 5.25 Inch Diskettes, Fits Into A501 RAM Slot, 8088 XT Processor, Clock/Calendar Included, Acts As 512K RAM Exp. When In Amiga Mode, Includes MS-DOS 4.01, Shell & GW-BASIC, Supports A590 Hard Drive, Mouse Driver Software Included. **£219.95**

MEMORY EXPANSIONS

HARWOODS PRO-RAMPACK **£29.95**
512K Memory Expansion for Amiga A500 series that simply plugs in! Fully compatible, On/Off switch and real time battery backed clock.

SUPRARAM RX 500 (512K to 8Mb. RAM Expansion)
The RAM expansion giving massive memory WITHOUT dismantling your Amiga, thus avoiding the possibility of invalidating your warranty. Easily connects to sidecar with bus 'pass-through' for HD's etc.

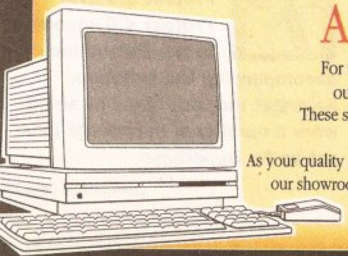
512K RAM Version	£129.95	4Mb. RAM Version	£329.95
2Mb. RAM Version	£199.95	8Mb. RAM Version	£549.95



NAKSHA MICROSWITCHED MOUSE	£24.95
GOLDEN IMAGE OPTICAL MOUSE	£32.95
COMPETITION PRO JOYSTICK 5000 Black	£7.95
ZIPSTICK JOYSTICK	£12.95
COMPETITION PRO STAR JOYSTICK	£14.95
The ONLY joystick to obtain a 100% rating from a magazine review!	
3.5" DISK HEAD CLEANER	£2.99

BLANK DISKS with labels

10 Genuine Commodore 3.5" branded	Only £9.95
10 Unbranded with library case 3.5" certified	Only £7.95
200 Unbranded 3.5" certified	Only £72.50



Apple™ in Alfreton...

For the professional user, Gordon Harwood provides the outstanding Apple™ Macintosh™ range of computers. These superb systems are available surprisingly competitive prices ....starting at under £1000

As your quality assured Apple™ Authorised Dealer, systems are available through our showrooms only. Please visit us for your personal introduction to this exceptional range of friendly yet powerful graphical computers.

Gordon Harwood Computers
Authorised Dealer

Easy Ordering

Before you choose from whom to purchase, please phone us. We are always happy to discuss your requirements, and answer any queries you may have...

ORDER BY PHONE: Phone our Order Hotline with your Access, Visa, Mastercard or Lombard Creditcharge Card quoting number & expiry date (most Dixons, Currys, NASCR and other 'store' cards are Lombard Creditcharge and are accepted by us).

ORDER BY POST: Make cheques, bankers building society drafts or postal orders payable to GORDON HARWOOD COMPUTERS. (Personal/business cheques take 7days to clear from day of receipt whereupon your order will be despatched). Please send Name, Address, and most importantly if possible, a Daytime Telephone Number along with your order requirements. Please check you are ordering from one of our latest advertisements before posting (phone if you require confirmation). Please remember that for example many September publications appear during August, therefore prices you see may have changed (either up or down).

FREE POSTAL DELIVERY: FREE within 14 working days, UK Mainland only. OR: **COURIER SERVICE.** Add £5.95 per major item for next working day delivery, UK Mainland most regions.

EXPORT ORDERS: Most items are available at TAX FREE PRICES to non UK residents when visiting /export shipment. Please contact us for ordering information.

REMEMBER AFTER YOU'VE BOUGHT FROM HARWOODS, WE'LL STILL BE HERE...

TECHNICAL SUPPORT: You will be given our Exclusive Technical Support Phone Number to call should you require any help or advice on any aspect of the system you have purchased.

12 MONTH WARRANTY: Items proving faulty within 30 days of purchase are replaced with NEW UNITS unless otherwise stated. For the whole guarantee period, warranty service will be completely FREE OF CHARGE.

COLLECTION FACILITY: Any computer, monitor or printer requiring warranty service can be collected from your home FREE OF CHARGE during the guarantee period (UK Mainland only) and a FAST turnaround is GUARANTEED by our OWN ENGINEERS!

FULL TESTING PROCEDURE: All computers are tested prior to despatch, and all items are supplied with mains plug and leads as required - just connect up and use straight away.

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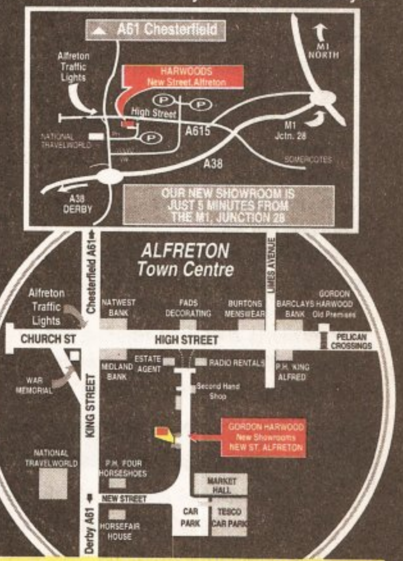
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using information read from a file in the DEVS: directory called 'System-Configuration'. Now, whilst I do *not* recommend that you try to edit your master disks, you may like to try making back-ups of your offending disks (wherever possible) and then copying a System-Configuration file to them from a disk which gives you the Preferences picture position that you want. This should solve your problem wherever you can make this change. ***GW***

PPAGE WON'T WORK

My system consists of an A1000 with 512K of Chip RAM and 8Mb of Fast on a Spirit Technologies RAM card. I have one external A1010 drive attached, and a Microbotics real-time clock in joyport 2. Apart from printer, monitor and mouse, I have no other peripherals connected. I use Kickstart and Workbench 1.3.

When I boot my system I disk-copy my complete Workbench to an 880K recoverable RAM drive called RAD: and assign all the usual things to it: C:, LIBS:, DEVS: and so on. I also mount a 2Mb VD0: recoverable RAM drive and set up the T: and ENV: directories and three pseudo hard drive partitions in it. I then launch any software that I use from the Workbench, using the CLI only for utilities that will not run from the Workbench. I have no problems using *Excellence!*, *Superbase Professional*, *Maxiplan*, *Scribble!*, *DPaint* or any other software package I use.

I have tried to make *Professional Page 2* run by following the directions in the manual – that is, opening a CLI and make the necessary assignments and then running the program. The computer just ends up Guru'ing when the program has about half loaded. I've tried making a small batch file to work from the Workbench via *IconX*, but this too makes the computer crash.

If I insert the *Professional Page* program disk at the Workbench hand prompt all works as it should, but this defeats the point of a multitasking computer. I can also get the program to work if, after loading my Workbench, I insert the *Professional Page 2* program disk in DF0: and then do a warm start. My Workbench still remains in RAD:, but it is no longer the 'controlling force' on my computer.

I have tried installing my *Professional Page* on to a friend's A2000 and GVP 80Mb hard drive. Even this did not work. The program crashed half-way through loading again. I have just ordered an A1500 and a very expensive hard drive. It would appear that I have wasted my money.

Finally, can you suggest a printer driver to use with *Professional Page* and my NEC P2200 24-pin printer, something that will get rid of the little white gaps that are evident every so often down the page?

Andi Bradley
BFPO 57

Don't panic, Andi, you haven't wasted your money. This sounds suspiciously like the very early version of *PPage 2* to me (namely V2.0) that has the nasty bug in it which prevents the program from loading if the system date is anything after 01-Jan-1991. Try using the Date command to set your clock back to (say) last year sometime and load *PPage* again in the normal way. If it loads, then you know you have a bugged copy and you should contact HB Marketing (☎ 0753 686000) about getting an upgrade. Gold Disk tells me that *PPage V2.1* will be here any time now, which fixes some bugs with the Compugraphic fonts, but the current version I am using is V2.0A.

The little white gaps you get on your print-outs are caused by the way 24-pin printers print graphics, using only 16 of the 24 pins. Because the line feed isn't able to move exactly the height of those 16 pins, little gaps appear every so often. Incredible as it may sound, you'll get better graphics dumps from a 9-pin printer. Try toggling the setting in Workbench Preferences between Fanfold and Single Sheet; this sometimes helps. My good friend Wolf Faust in Germany has written a truly excellent NEC 24-pin printer driver called Nec24Plus, which can be obtained on Jamdisk #3 from *Just Amiga Monthly* (☎ 0895 274449) for a couple of quid. ***JW***

JARGON BUSTING • JARGON BUSTING

CON – An AmigaDOS device that accepts text input and produces text output in a window. Key-presses are filtered to enable editing, and nothing is sent to the controlling program until the user presses [Return]. An example is the CLI window.

IDCMP – Intuition Direct Communication Message Port. The mechanism by which mouse commands to control windows (close, open, re-size and so on) are transmitted to the program controlling the relevant window.

Intuition – The part of the Amiga's operating system concerned with window handling, menus and so forth. It interprets user input from the mouse and sends information to the programs controlling the relevant windows via the Intuition Direct Communication Message Ports.

RAW – An AmigaDOS device, similar to CON:, but without any translation functions. Instead it passes unprocessed keyboard data to the controlling program.

GETTING CHARACTERS

I have been trying to write a C function that behaves in the same way as the getch() on the PC. I know that the Kernighan and Ritchie manual shows how to write the function, but this doesn't seem to work as it should on the Amiga – the function waits for the [Return] key to be pressed. Please help!

Ted Murphy
Torpoint
Cornwall

The problem with the K&R example you've mentioned is that the getch() function uses the getchar() routine. Depending on the computer system being used this function can unfortunately exist in either interactive (which handles direct key input) or line-oriented forms (which expects input to contain a terminal [Return]).

On the Amiga, programs which are kicked off from a CLI/Shell window are using a 'CON:' window. Since this is based on a line-oriented I/O model, I'm afraid that, as far as 'CON:' windows are concerned, you are (for simple programs at least) stuck with the [Return] key problem.

Once you get into the Intuition/Devices areas of Amiga programming, such problems disappear because it's possible to use things like the Intuition IDCMP system to obtain messages about keypresses (and any other events) which occur. At this stage all things become possible!

If you want an easier way of collecting keypresses directly and your programs are essentially CLI/Shell type window based (ie character stream rather than graphics based) then one solution is to open a 'RAW:' window and use that (this window could then be used in all of your program's I/O operations).

RAW: provides unbuffered screen and keyboard I/O, and keypresses can be read (unechoed) by a program immediately. (There is a lot of information about the RAW: console device, low level read/write operations in the *AmigaDOS Manual* published by Bantam Books.)

This short C example should convince you that immediate key collection without echo is possible. It opens a RAW: window and then closes it as soon as a key is touched (even before the key is released):

```
#include <stdio.h>
#include <dos.h>
main()
{
char c; BPTR file_handle;
file_handle=Open("RAW:20/20/↵
500/100/MyWindow",          ↵
MODE_NEWFILE);
Read(file_handle, &c, 1);
/* In this example the RAW:
window will disappear as
soon as a key is pressed */
Close(file_handle);
}
```

PAO

STARTUP SHUTDOWN

I have altered my Workbench startup-sequence to the one recommended for 1Mb machines in *Cracking The Shell* in Issue 6, but I can only get the machine to boot up part of the way. After a time it gives the error message 'unable to load sys:prefs: object not of required type.' Where am I going wrong?

Jim Merrilees
Bishopbriggs
Glasgow

The error lies in the line:

```
sys:prefs add
```

In fact, this should be part of the previous line (as denoted by the arrow in the listing), but was printed separately because of the restrictions of our column width. If you type these two lines in as one line, everything will work in a hunky dory manner. ***CR***

PROTEXT PRINT PUZZLE

I recently installed *Protext 5.0* over *Protext 4.0* according to the instructions accompanying the software. Amongst the text files I retained were a number of mailmerge files set up for *Superbase*.

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I now find that after a few minutes mailmerge printing I get the 'Printer Trouble' system requester. This seems to me to occur when the Sharp JX-9500 laser printer's RAM buffer (2Mb) is full. Waiting until the printer stops and then clicking on the resume button recommences printing until, after a few minutes, this all happens again.

This is naturally extremely annoying during a large mailmerge, when I would like to leave the computer to do the work. It did not happen with the *Protext 4.0.* printer driver. The printer emulation and printer set-up are all as before. Any ideas?

Ian Surgeon
Ballinasloe
Ireland

Protext uses its own pseudo printer buffer in order to get the printing process over as quickly as possible and let you get back to word processing or whatever. Known as 'background' printing, it is selected from the Main/Other section of the *Protext* configuration program. Setting background printing to ON will ensure that *Protext* feeds data into its own buffer when the printer's buffer becomes full. ***JW***

COPYING FILES

How can I get a file from a data disk on to my copy of the Workbench disk? I need to know the name of the directory and the file before making the copy. If I put the data disk in my one and only drive and enter 'dir', I am asked to insert the Workbench disk. When I do so, it gives me a directory listing of the Workbench disk and not the one I am trying to read. Even if I make the command resident, it still prefers to take the program from my Workbench disk. I have managed to copy 'cd', 'dir' and 'copy' to the RAM disk and use those files to transfer the file I want via the RAM disk. All this takes time and is prone to errors. I can't help wondering, is there a quicker way?

Two other questions: how can I change the name of a disk and why does the 'alias' command only work some of the time and at other times become an 'unknown command'?

Alan Baker
Bournemouth
Dorset

You certainly have the right idea about using 'resident'. The flaw in your cunning plan is that when you type 'dir', your current directory is still on the Workbench disk, even though a different disk is in the drive. That's why you are asked to replace Workbench. The way to get round this is to type:

```
dir df0:
```

instead, which asks for a directory of the disk currently in drive 0 (but only if 'dir' is resident).

Probably the best way to go about this is to use the actual names of the disks in question. The Workbench disk is called 'Workbench1.3:'; you can find out the name of the other disk by making 'info' resident and then typing it with the relevant disk in the drive. Remember that all disk names are followed by a colon when referenced from the Shell.

This then gives you two options when you come to copying. Usually the easiest is, as you have found, to copy the file from the source disk into RAM:, and then to copy this on to your Workbench disk. This can be done as follows:

```
copy MyDisk:WhereItIs/        ↵
InterestingFile RAM:
copy RAM:InterestingFile      ↵
Workbench1.3:
```

This is impractical if the file you wish to copy is larger than the space available for your RAM disk. In this case, you can use the copy command to go from the source and destination disks directly, but only if you know their names:

```
copy MyDIsk:WhereItIs/        ↵
InterestingFile
Workbench1.3:
```

You will then be prompted to perform a number of disk swaps before the operation is complete.

There are two ways to change the name of a disk. The easiest is from Workbench. Just single click on the disk, select the 'rename' option from the Workbench menu and type the new name in the window provided.

If you prefer to use the Shell, you can change a disk's name with the 'relabel' command. In this instance, you can make the relabel command resident, and then type:

```
relabel df0: NewName
```

(Note you don't need to include the colon as part of the new name). Alternatively, you can refer to the disk by its old name, as in:

```
relabel MyDisk: NewName
```

As for your 'alias' command only working some of the time... well, it should work all of the time. Is it that you get an 'unknown command' after attempting to make the alias? In this case, the only thing I can suggest is that you are sometimes booting up with an early version of Workbench which does not support alias. If, on the other hand, the unknown command error occurs when you attempt to make use of an alias you have already assigned, then the answer is that you have made an alias to an unknown command or one with an incorrect path name. ***CR***

JARGON BUSTING • JARGON BUSTING

IFF – Interchange File Format is a means by which data from different graphics or sound sampling programs are saved in a compatible way. It allows data to be exchanged between programs very easily and avoids the situation on, say, the PC where dozens of different graphics packages each save data in incompatible formats.

Keymap – A file used by the Amiga to translate key presses into the relevant characters for a given country, since different countries have different layouts for their keyboards.

Pascal – A structured programming language developed by Nicklaus Wirth, common in academia.

RAM buffer – A temporary storage area placed between a program sending data and a device receiving it. The use of a buffer means that the sender and receiver do not have to be working at the same speed, and that the sender isn't tied up waiting for the receiver to finish processing the data it already has.

Resident – An AmigaDOS command that loads another command into memory so that it need not be loaded from disk whenever it is used. Also, if several different programs are using the same command, only one copy need be held in memory, rather than one copy for each instance.

Virus – A small program that can lie hidden in memory or on a disk, duplicating itself on to any disks inserted in the machine, and generally causing havoc. Virus killers, available in the public domain, are designed to deal with this menace.

SCANNING DOCUMENTS

Having acquired many old documents during my research into my family history, I would like to be able to load them into the various programs I use.

I know a hand scanner is the obvious answer, but they are expensive. I do have a fax machine which, after all, is a scanner. Can the output of the fax be fed into the Amiga via an adaptor? Such a thing was apparently available for an Amstrad.

Grahame Slope
Plymouth
Devon

Even if you do manage to feed the fax's output to the Amiga, you are faced with a much more complex problem. Such data would be stored as a picture, not as characters and words. The conversion from one to the other is a very complex process (optical character recognition) and I know of no Amiga programs that will do the job. Frankly, I think you have a lot of typing to do. ***CR***

QUIDS IN

I have recently bought *ProWrite 3.1.1*, which for some unknown reason only wants to use the American keyboard, resulting in me having to use Edit/Insert/Literal when I want quotation marks or the pound sign.

If I change the keyboard, using the following procedure, it will change into UK mode, putting the quotation marks and the pound sign where they should be, and it will stay that way until the machine is re-booted, after which it always reverts to the US keymap.

The procedure I am using is to select Setmap from the System drawer, select Info from the Workbench menu, type 'KEYMAP=gb' into the Tool Types string gadget, select Save, and then double click on the Setmap icon.

Half the time when I follow these steps, when I select Save I am presented with a system requester telling me that no keymap has been specified in the icon's Tool Types. I then have to re-boot the machine and repeat the procedure until it accepts the UK version.

Terry Birch
Castle Donington
Derbyshire

You're half-way there, Terry. Forget all this clicking on icons and changing the Tool Types stuff. To make the change permanent edit the startup-sequence file on the *ProWrite* System disk. Change the 'usa1' after the 'SYS:System/Setmap' into 'gb'. Next time, and every time, you boot from that disk the double quotes will be on [Shift]-[2] and the pound will be on [Shift]-[3]. ***JW***

MAC PICTURE IMPASSE

A My friend runs a DTP bureau and has saved some scanned pictures on his Mac in PICT form. I purchased *MacView* from the public domain so that I could view these files and save them in IFF format.

My problem occurred when I tried to use the program. On inserting the disk, the program attempts to read it and a requester appears saying, 'Not a DOS disk in unit 1'. I then asked my friend to save the pictures on to a PC format disk, which he happily did, but the same problem occurred. My friend has no way of saving these files on to an Amiga formatted disk. I would be grateful if you could tell me how I can input these pictures.

I also have a few questions regarding the Pascal compiler on Fish Disk 339. Was it necessary for me to save the following commands on to a Workbench disk: Pascal, A68K, Blink and PCQ.lib? I had to get rid of all of my utilities and most of my system on the Workbench disk to give me enough room to save the first three. I didn't have enough room to save the file PCQ.lib on to it as well.

By keeping the PCQ.lib file where it is, on the Fish Disk, I can get my program to compile and produce object code successfully. When I try to link it using 'Blink prog2.o to df1:prog2 library PCQ.lib' I get the error message 'PCQ.lib is a load file'. Please help me, and if possible spell it out.

Isthiaq Ahmad
Edinburgh

The answer to your first problem is a straightforward one. You need a program to enable the Amiga to read PC formatted disks. There are a number of these available; the PD program *MessyDOS* (Fish Disk 382) will do the trick.

It is useful but not necessary to put all of the Pascal commands on your Workbench disk. But, wherever you put them, you must let the Amiga know where they are, so that the files can be found when it is time to use them. If, as in your case, the file PCQ.lib is on a different disk from the others, then you must specify this in the linker command line. If your Pascal disk is called 'AmigaLibDisk339', then when it came to the linking stage you would type:

```
Blink Prog2.o to df1:prog2 ↵
library                    ↵
AmigaLibDisk339:PCQ.lib
```

Probably the best bet is to put all of these files on a blank disk, along with the minimum from Workbench necessary to get things going.

Put Pascal, A68k and Blink in a c: directory, and PCQ.lib in a libs: directory. Also, copy an editor such as Workbench's Ed into the c: directory. A few of the more common commands such as dir, cd, makedir, type, resident, mount, prompt, endcli, run, path, addbuffers, setpatch, BindDrivers, newshell and assign will come in useful, so put these in the c: directory as well. You will need to make a devs: directory and copy mountlist and ramdrive.device into it. Take Ram-Handler, Newcon-Handler and Shell-Seg from the Workbench disk and put them into an l: directory on your new disk. Make a system directory, and put FastMemFirst and SetMap (from the same directory on your Workbench disk) there. In the devs directory create a sub-directory called keymaps. Into this copy the gb file from the equivalent Workbench directory.

You will need to give the disk a simple startup-sequence. Create an s directory, copy into it shell-startup and also inside it create a file containing something like the following (you can of course customise it as you see fit):

```
Addbuffers df0: 22
Addbuffers df1: 22
c:SetPatch >NIL:
Sys:System/FastMemFirst
BindDrivers
makedir ram:t
resident CLI L:Shell-Seg    ↵
SYSTEM pure add
mount newcon:
sys:system/setmap gb
c:path sys:system add
run newshell
endcli >nil:
```

You may also find it a good idea to copy the Pascal include directory and all of its contents to your new disk, placing them in a directory called 'include'. This will mean that your whole development system is contained on one disk, along with 40% spare for your own code, saving you the inordinate amount of disk swapping normally necessary when writing programs. ***CR***

VIRAL VACCINE

A Strange things have recently started happening to my machine and I would like to know if I have a virus or something that's going to cost a lot of money to fix.

Whilst trying some of the utilities on the disks that came with *Get The Most Out Of Your Amiga,* I needed to make some backup copies of Workbench. All went well up to the point of actually copying, when everything came to a halt. The window came up with 'reading track 0, 79 to go' and that was it; the drive motor ran but no further action took place. I tried several other disks, all with the same result. Eventually I used my master disk, which also produced the same result.

On using Diskdoctor, all disks had the same unreadable files, yet all worked perfectly up to that point. I copied some Workbench disks from a friend's machine. They worked fine on his and once on mine before becoming corrupted in the same way.

I used *Virus Killer 2* which found a virus and then crashed; but then it seems to do that on most disks anyway. I tried *ZeroVirus* which found no virus on the bootblock, but I was unable to get it to look anywhere else. What do you think?

Finally, can you tell me a way of getting documentation, such as ZeroVirus.Doc, out to a printer?

Martin Jukes
Dagenham
Essex

It sounds very much like you have a virus. We have had several people write in with this problem, and at first thought it was a hardware fault. Simon Beales, of Altrincham in Cheshire, has kindly written in to inform us that the cause of this problem is a Lamer II virus (thanks Simon; a fiver shall be your reward).

ZeroVirus should be able to deal with this. At the main menu, click on the [Files] option. Then use the right-hand mouse button to get the menu at the top of the screen (invisible until you press the mouse button) and select the [Check Files] option. In the requester, type in the drive you wish to check (df0:, df1: etc) and click on [OK]. You will be asked if you want all subdirectories checked as well. Click on [Yes]. Finally, the program will ask if you want it to remove any viruses found. It seems sensible to click on [Yes] at this point. And away it goes, purging your disks.

I suggest you repeat this operation on all of your disks. Be very careful about putting non-write protected disks into your machine because you may spread the virus again before you have eliminated it. Even though you will have killed it, I'm afraid it may well have done some irretrievable damage.

If you got your copy of *ZeroVirus* from an Amiga Format cover disk, then getting a printout is easy. Click twice on the document file, as you would to read it, and then select the print option from the menu. Alternatively, you can get a printout of the document by using the CLI or Shell. Just type:

```
copy diskname:ZeroVirus.   ↵
doc to PRT:
```

CR

LEARNING TO C

I want to learn C, but I am not sure which books and programs are best. I have the *NorthC* compiler but it is not easy to use; it needs extra files for it to work and I have heard that it will not compile all C programs without alteration. I have sent off for the *C Manual* on disk, but a hard copy would be needed and I do not think my printer could handle it. So which programs and books would you recommend (the cheaper the better)? I am especially interested in disk operations and passing parameters between programs.

Leo Crawford
West Malling
Kent

I am surprised that you think your printer could not handle the *C Manual*. If this is the case, you need a new printer – the *C Manual* is a perfectly straightforward set of text files.

If you want a cheap C compiler, then the option is a PD one, in which case *NorthC* is a good choice. Admittedly, it takes a little bit of sorting out, and you will need the Commodore include files for complex work, but this is the case with all PD compilers. In fact, commercial compilers are also difficult to use – learning to program is something which requires a lot of effort. If you want a commercial compiler, then I would recommend *SAS C* (£229 from HiSoft ☎ 0525 718181).

A good tutorial book is *Mastering Amiga C* (ISBN 1 873308 04 6) by our very own Paul Overaa. It is published by Bruce Smith Books and costs £19.95. You will, of course, sooner or later need the Amiga Reference Manuals. There are two *ROM Kernel Manuals*: *Includes and Autodocs* (£28.95 ISBN 0 201 18177 0) and *Libraries*

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and Devices (£29.95 ISBN 0 201 11078 4). Both of these are published by Addison-Wesley. You will also need Bantam Books' *AmigaDOS Manual* (£21.99 ISBN 0 553 35403 5). ***CR***

KINDWORDS I

I've managed to strip various fonts from other disks and use them with *DPaint*, but I can't seem to get them into *KindWords*.

I think the article on word processors was great, but I'm still confused. As far as I can make out I'm going to need a good word processor and use that to import documents into a DTP program to be able to achieve the best results. Can you give me an idea of which to choose? And please explain what the various font types are; Compugraphic, for example.

Finally, how can I get my Star LC-10 printer to print as well with fonts from my word processor as I can with its built-in fonts. Do I need *Turboprint Pro* or to change my printer driver?

Mike Chopin
Meingau
Dyfedd

KindWords can't use standard Amiga bitmap fonts, such as those you've taken from other disks and used with *DPaint*.

You have a few choices. You can pay out £200 or more for *Professional Page* or *PageStream*. *PPage* comes with a good text editor (a slightly altered version of *TransWrite 2.0*) which integrates seamlessly with the main DTP package, provided you have plenty of memory — 2Mb minimum I would suggest. *Pagestream* comes with a simple (and slow) built-in text editor; you may find this good enough, if not you may have to splash out a bit more on something like *TransWrite 2.0*, which is a good, inexpensive word processor.

Alternatively, you could buy *PageSetter II* and *TransWrite 2.0*, which together should set you back less than £100 if you shop around. Bear in mind that *PageSetter II* can't handle colour. Or you could buy *Gold Disk Office*, which comes with an enhanced version of *PageSetter II* and a text editor, plus a spreadsheet and some other businessy stuff. I've seen this for sale at computer shows for as little as £45.

All three of these DTP programs can use Compugraphic fonts. Put simply, these fonts (which are also known as 'outline' fonts) can be scaled up or down without any loss of output resolution, unlike standard Amiga 'bitmap' fonts, which get blockier and blockier the bigger they are scaled. Compugraphic fonts take up lots of memory and slow the program down, but the end results are worth it.

The other type of fonts you hear a lot about are PostScript fonts. These are similar in principle to Compugraphic fonts, and are the nearest thing we've got to a standard across machines from different manufacturers. Alas, the company which makes PostScript fonts (Adobe) does not yet supply them in a format that can be read directly by the Amiga.

There is an AMOS licenseware program called *Star LC-10 Fonts* that will let you design and download some good quality character sets to your printer. These can then be used by any word processor that allows you to use the printer's internal fonts. Check out the PD library adverts for where to get AMOS licenseware. ***JW***

EDITING VOICES

I wish to write a voice editor for my keyboard using AMOS. Can AMOS talk to the outside world? If so, how, and is there any text around that covers this subject? If not, how hard would it be to use *NorthC* to achieve basic communication?

I am prepared to use Amiga Basic if it can talk to the MIDI device, but only if you start me off with some information.

Paul Harling
Slough
Berkshire

AMOS provides facilities to communicate with both the serial and parallel ports. Which one you use will depend on which port your MIDI interface uses. The syntax to write information to the serial port is:

```
Open Port 1,"SER:"
Print #1,"Hello World"
Close 1
```

Replace the quoted token 'SER:' with 'PAR:' to use the parallel port. Reading information from the port is achieved with the 'Input #1,variable$' statement.

You can change the baud-rate and so on from the Workbench Preferences screens. ***CR***

CLIPPING HELL

I recently inherited a pile of clip art disks. Most are okay, but some have the extension '.iff.pp' and I'm not able to access these. Can you tell me how I can use them?

Also, I've yet to discover a way to enlarge my clip art in *PageSetter II*. Have I missed something?

Anthony Harratt
Congleton
Cheshire

The '.pp' extension signifies that these files have been crunched by a program called *Powerpacker* to make them take up less space on the disk. To turn them back into standard IFF graphics that can be imported into *PageSetter II* you will need to get hold of a copy of this program and decrunch them. There is a shareware version of *Powerpacker* which should be available from any decent PD library.

Enlarging clip art in *PageSetter II* is simple. Load the graphic into a box, hold down the [Alt] key and then use the mouse to drag one of the handles around the edge of the box until it is the size you want it. (Drag means hold down the left mouse button and move the mouse.) ***JW***

PASCAL PROBLEM

The program below, copied from a Pascal programming guide in *The Computer Tutor*, does not work with *PCQ Pascal*. I get the error: 'Duplicate ID on line 5'. Can you or anyone help me?

```
PROGRAM Date(input,output);
CONST
  FullStop = '.';
TYPE
  Calendar = (Jan,Feb,Mar, ↵
Apr,May,Jun,Jul,Aug,Sep, ↵
Oct,Nov,Dec);
VAR
  Monthname : Calendar;
  day,
  month,
  year,
  left : integer;
  symbol : char;
  LeapYear : boolean;
BEGIN
  WriteLn ('Enter the date ↵
in the form :');
  WriteLn ('DD/MM/YY' : 40);
  WriteLn;
  Write ('Date ? ');
  Read (day, symbol, month,↵
symbol, year);
  LeapYear := year MOD 4 =0;
  {neglecting centuries}
  IF (month>0) AND ↵
(month<12)
  THEN
          CASE month OF
          1 : Monthname :=
Jan;
          2 : Monthname :=
Feb;
          3 : Monthname :=
Mar;
          4 : Monthname :=
Apr;
          5 : Monthname :=
May;
          6 : Monthname :=
Jun;
          7 : Monthname :=
Jul;
          8 : Monthname :=
Aug;
          9 : Monthname :=
Sep;
          10 : Monthname :=
Oct;
          11 : Monthname :=
Nov;
          12 : Monthname :=
Dec;
          END {CASE}
  ELSE
  BEGIN
          WriteLn ('Eh?');
  END; {monthname is ↵
uninitialised}
  CASE Monthname OF
  Jan, Mar,
  May, Jul : Left:=31-day;
  Apr, Jun,
  Sep, Nov : Left:=30-day;
  Feb : IF LeapYear
  THEN
          Left:=29-day
  ELSE
          Left:=28-day
  END; {CASE}
  WriteLn;
  Write ('There are ',Left ↵
: 1, ' days left in ');
  CASE Monthname OF
  Jan : Write ('January');
  Feb : Write ('February');
  Mar : Write ('March');
  Apr : Write ('April');
  May : Write ('May');
  Jun : Write ('June');
  Jul : Write ('July');
  Aug : Write ('August');
  Sep : Write ('September');
  Oct : Write ('October');
  Nov : Write ('November');
  Dec : Write ('December');
  END; {CASE}
  WriteLn (FullStop);
END.
```

Could the example 'mandel' program be compiled with a PC compiler to work on a PC, or would there have to be changes to the source code? When will you be doing a Pascal tutorial?

Glenn Riley
Belper
Derbyshire

This one had me foxed for a while. For some reason, *PCQ* does not seem to like the token 'Dec' in the enumerated type definition. If you replace all occurrences of 'Dec' with 'De', then the program will compile.

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continued from page 67

Incidentally, there are a number of other bugs in the program. The conditional line which reads 'IF (month>0) AND (month<12)' should actually read:

```
IF (month>0) AND (month<=12)
```

otherwise the program will ignore December. Furthermore, when the program checks for which months have 31 and 30 days, it misses three months out. The lines in question should read:

```
CASE Monthname OF
Jan, Mar,
May, Jul,
Aug, Oct,
Dec : Left := 31-day;
```

with the following lines as before.

The 'mandel' program would have to be changed before it could be compiled on a PC. All of the graphics function calls would have to be altered to take into account the graphics libraries supplied on the PC.

We will run a Pascal tutorial if demand warrants it. In the meantime, keep an eye out for Pascal's turn as Language Of The Month. ***CR***

STARTER'S ORDERS

It's my son's birthday and I have been ordered to buy him a printer for use with *Protext 5.5* and *Professional Page 2*.

I am aware of the limitations of dot-matrix printers in the field of DTP, and so I am considering an inkjet rather than a 24-pin dot-matrix. I read your review of the Canon BJ-330 and was quite impressed. However, I don't think he'll need such a wide carriage as he will mainly be printing on A4 paper.

What are the differences between the BJ-330, BJ-130 and BJ-10e? Can they output Compugraphic and downloaded fonts without distortion by the feed mechanism, or would the HP Deskjet 500 be better, assuming it can produce the same quality output on 'normal' paper? What would best suit his needs bearing in mind a budget of at most £350?

R J Shaw
Salford
Lancs

The BJ-130 is no longer available, having been superseded by the BJ-300. This printer is a standard A4 width version of the BJ-330. Both of these cost more than £350. So does the Deskjet 500, which retails at £499 plus VAT.

The BJ-10e is within your budget. It's a portable bubble jet printer that takes A4 paper. It costs about £300 and has one 'emulation', the IBM Proprinter X24e, plus its own printing mode, which is the same as the old BJ-130e.

Provided you have the correct printer driver (available from Canon), the BJ-10e will output Compugraphic fonts at a maximum resolution of 360 by 360 dots per inch. The feed mechanism is pretty good, and one big advantage of the BJ-10e is that every time you put a new cartridge of ink in, you are also renewing the print head. The cartridges are supposed to last about 700,000 characters in high quality mode. The big disadvantage is that in normal text mode (that is, when printing normally, not from a DTP program) it is very slow, managing only 83 characters per second at 10 characters per inch (the BJ-300 can do 300 cps). *Protext 5.5* is supplied with a CANONBJ driver which works with the BJ-10e. ***JW***

KINDWORDS II

I have some problems with *KindWords 2*. I recently bought an Amiga 500 with 512K RAM and a Star LC-10 printer. The first of my problems is that the printer refuses to print the pound sign, printing the number 7 instead. I know the problem is with *KindWords* because the Star's test print produces the pound sign, and the Workbench keymap is correct because screen dumping the file is without problem, except for the layout being wrong.

The second problem is that I can't load graphics into the document because I don't have enough memory. Will an expansion solve this? Do I need Fast memory or Chip memory?

Finally, I have a problem with my Workbench disk. I tried to make a second copy of Workbench so that I could add *VirusX* to the startup-sequence. However, whether I use Diskcopy or the CLI, after I first insert the source disk the disk drive light goes on and never goes off; I never get the destination disk prompt.

***Amiga Format* said this was a virus, but *VirusX 4.0* didn't detect it. I solved the problem by using the original Workbench disk to make the copy, but later I had to make another copy because I had *VirusX* telling me that the Lamer Revenge virus had been in memory, but was now destroyed. Ten seconds later the window appeared again, ad infinitum.**

I formatted the disk to write another copy over it, and the original refused to copy. So I used an *Amiga Format* cover disk to supply the operating Workbench.

I'm still worried that I have a virus in my system.

Sean Donohue
Argos Hill
East Sussex

My, you are having problems. Let's sort out your Workbench disk first. It does sound like you have the *Lamer Revenge* virus.

This is a file virus which claims to speed up your disk drives by 800 per cent. Actually it does the opposite, as you've discovered. It reads the startup-sequence file when you re-boot and edits that file so that the startup-sequence runs the virus program. It sticks out a mile because the first line in the startup-sequence will be blank. Although *VirusX* can detect this file in memory, it cannot eradicate it from your disk. If you edit your startup-sequence and remove the blank line at the top, the virus will not be run when you boot from that disk. To remove the actual virus program you will need to get hold of a more modern virus catcher, something like *Virus_Checker* or *VScan*. Ask your local PD library about these.

Don't panic, you probably haven't damaged your original Workbench disk. But you should sort this problem out before you infect any more disks. And *don't* give any disks to friends until you're running a clean machine again.

The odds are that every disk in your collection that you boot from will have this virus on it. You've got a long job ahead of you, Sean.

Ok, now *KindWords*. If you buy some expansion memory you will be able to load pictures into your documents. Although these need to load into Chip (aka graphics) memory, any memory expansion will do. Make sure you have the line 'SYS:System/FastMemFirst' early in your startup-sequence, and the FastMemFirst program in the System drawer of your boot-up disk, and this will ensure that the *KindWords* program loads into your expansion memory, leaving graphics memory free for pictures.

The pound sign problem is a puzzler. I've tried to get *KindWords* to print a 7 instead of a £, and I can't do it. Check you are using a compatible printer driver, the EpsonX[CBM_MPS-1250] driver should work with the LC-10 OK. Also check the printer's dip switches are set correctly to use the Epson emulation mode and the English character set. ***JW***

KEEP IT IN THE FAMILY

I have an old 8-bit Plus/4 (from around 1983-ish) and have several ASCII documents stored on the old machine which would be useful to have on the Amiga. To do this, I have decided to build a null-modem cable and run it from the RS-232 port on the Plus/4 to the serial port of my Amiga. I have all of the software side of things sorted out – I intend to run both machines as fast as they can go (19200 baud) and have software running on the Amiga which will spool the data to the RAM disk device.

Which pins should I connect together to enable the machines to talk to each other?

Mark Thompson
Swindon
Wilts.

I spoke to Brian Fowler of ICPUG, who told me that the 8-bit CBM machines use a 5-volt serial system, instead of the 12 volts used in RS-232.

In theory, you could get away with a direct connection with a short null modem lead, but it would be advisable to use an interface to convert the voltages. Brain Boxes (☎ 051-220 2500) can supply such a device, and may be able to help with the other connections you need. ***SCR***

JARGON BUSTING • JARGON BUSTING

Chip RAM – This is the area of the Amiga's memory directly accessible by the custom graphics and sound chips. Originally a maximum of 512K, newer machines fitted with the Fatter Agnus graphics chip can access 1Mb, allowing smoother animations and more screens to be displayed at once. The new Amiga 3000 comes with an Agnus chip capable of addressing 2Mb of Chip RAM.

Fast RAM – Any extra memory which is not Chip RAM. The custom chips cannot access it, and because such accesses to Chip RAM can block out the central processor and slow down its own accesses, Fast RAM is faster.

RS232 – A standard interface, down which information is sent one binary digit at a time. It is used for linking other computers, connecting printers, and connecting to modems.

Beginners start here

On the next three pages, deputy editor Cliff Ramshaw answers a number of question frequently asked by those new to the Amiga

Having taken your brand new Amiga out of its box and plugged it in, you may well be more than a little bewildered at what confronts you. Although the machine is on the whole easy to use, there are a host of concepts to learn before you can make full use of it. Here we aim to outline some of these fundamentals to save you time and effort in coming to grips with your new machine; but always remember that the best way to learn about the Amiga is to experiment.

WHAT IS A COMPUTER?

A computer is a machine which will follow a set of instructions. It cannot think, but merely does what it is told. The instructions which it follows can come from a number of sources: instructions held internally, from the makers of the computer; instructions from a third-party program which is loaded in from a floppy disk; instructions from you, the user, typed in at the keyboard. The results, known collectively as 'output', are sent either to the screen, to the printer (if you have one) or to the disk in the floppy disk drive.

HOW DOES IT WORK?

Well, without getting carried away... at the heart of the machine is something called the Central Processing Unit (CPU). This is the bit which interprets the instructions sent to it (in a very simple language called 'machine code') and does what they tell it to. The instructions are held in the computer's memory.

MEMORY

The classic analogy is that of comparing memory to matchboxes. Imagine an incredibly long row of matchboxes, each numbered and each with something inside it. The contents of a memory location can be found or changed by referring to the number of the relevant matchbox, opening it and taking a look (or putting something else in). In practice, all that these matchboxes contain is numbers, but these numbers can be understood by the computer as words, pictures or sound (or indeed they can be kept as numbers). There are two main types of memory: RAM and ROM. RAM (standing for Random Access Memory) can be altered at any time by the computer. Once the power is switched off, the contents of RAM are 'forgotten'. ROM (Read Only Memory), on the other hand, is never changed, even when the power is switched off. It contains the basics of the operating system – the set of instructions which determine the overall behaviour of the machine at all times.

Memory is measured in units known as bytes. In every byte a number between 0 and 255 can be held. To hold bigger numbers, or more complex items of information, bytes are joined together into larger units. More conveniently, memory is spoken of in terms of kilobytes (K) or Megabytes (Mb). A kilobyte is 1,024 bytes; a megabyte is 1,024 kilobytes or 1,048,576 bytes. The reason that they are not nice round 1,000s and 1,000,000 lies in the organisation of bytes according to the rules of binary arithmetic, but that's not important right now...

FAT AGNUS

Possibly the most common question we get asked here at *Amiga Shopper* is about the Fat Agnus chip. Agnus is one of several custom chips inside the Amiga dedicated to producing graphics and sound. Whereas the Amiga's central processor can access all of the memory in the machine, the Agnus chip is limited to a much smaller portion, known as Chip RAM (since it can be accessed by the custom chips).

It is here that graphics information must be stored. Anything you see on the screen has an equivalent form inside the Amiga's memory, in Chip RAM, and it is Agnus (amongst others) that does the job of converting this information into the form of a picture.

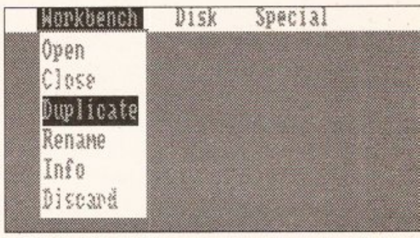
The rest of the Amiga's RAM (as opposed to ROM) is termed Fast RAM. Whenever Agnus accesses the Chip RAM, it prevents the Amiga's central processor from doing so at the same time. Because much of what a processor does involves accessing memory, this has a tendency to slow the processor down. Memory which is not Chip RAM, on the other hand, can be accessed by the processor whenever it likes, without a speed penalty. And that's why it's called Fast RAM.

Now, the more Chip RAM, the better, since it means that more complex graphics can be on screen at once, bigger and smoother animations can be performed and more impressive sound samples used. The early Agnus chips could access 512K of Chip RAM, or half of a megabyte (the amount of memory that comes with an Amiga 500). This chip is numbered 8361, and was present on A1000s and early A2000 machines.

After that came the Fat Agnus, with a shape more like that of a square and a couple of extra features. This is the one in the majority of Amigas. Its part number is 8371 (or 8370 for the American version). Like its predecessor, it can access 0.5Mb of Chip RAM.

In the last year or so, Amigas have been released with an even newer Agnus chip. This is known as the Fatter Agnus, and it can recognise 1Mb of Chip RAM. It has part number 8372a. An even newer version exists, accessing 2Mb of Chip RAM, but this is only available for the new Amiga 3000.

Hope that's cleared things up.



The Workbench menu; and someone's about to try duplicating a disk.

WHAT ABOUT DISKS?

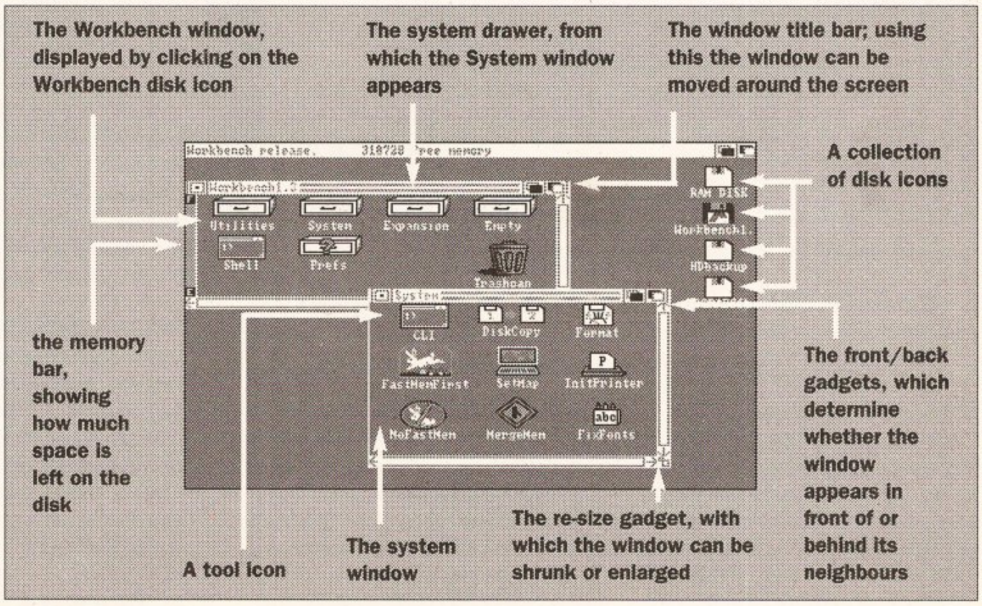
Disks can be thought of as removable memory. The difference is that the processor cannot directly access anything held on a disk. Before it can get its hands on it, the contents of the disk must be 'loaded' into the computer's RAM.

Information is stored on a disk in the form of files. A file is simply a grouping of related infomation with a name. The information is referenced by using the file name.

INFORMATION

Two types of information may be held in memory and on disks. The first type is the information which makes up a program. A program is a collection of instructions for the computer to follow. As well as the operating system, which is nearly always present, the Amiga may have several programs 'running' inside its

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This illustration shows the basic components of the Amiga screen.

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memory at any one time. These can instruct it do such things as draw pictures or operate a spreadsheet.

The second type of information is known as 'data'. This is also held in RAM, but instead of providing instructions for the CPU, it provides information on which the programs may operate. For instance, a program which adds two numbers together needs some data before it can be of any use. These two numbers are the program's input data. The result of the addition is the output data. Another example is given by the *Deluxe Paint* package. This is a program. Any key presses or mouse movements you make are input data for the program; the picture that is gradually drawn is the output data. Of course, this picture may be saved on to a disk at any time, and loaded back at a future date. In such a case, the picture has now become input data for the program. As you can see, the distinction between input and output data can become somewhat blurred.

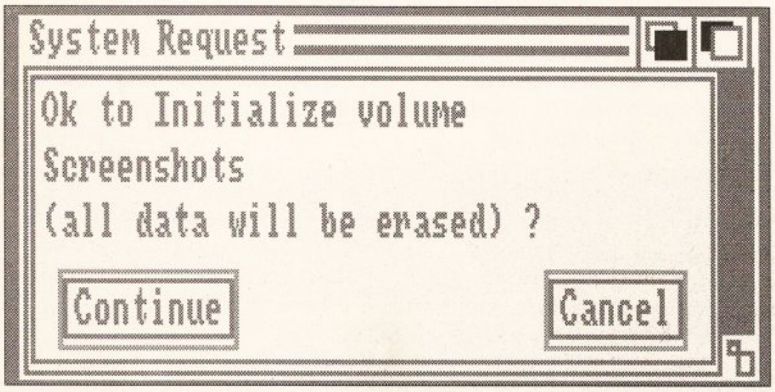
WIMP

In days of yore, people used to control computers exclusively by keyboards. Because of the relatively new WIMP (windows, icons, menus, pointer) system, many tasks can be greatly speeded up and performed in a more intuitive manner (hence the name of the part of the Amiga's operating system that deals with this: Intuition).

All disks, programs and related collections of data are displayed on the screen as small pictures, known as icons. To prevent things getting too cluttered, the screen is divided into small sections called windows, in which the icons relevant to that window are displayed. Each window may be open or closed (in which case it reverts to either a disk or a drawer icon), moved around relative to the screen, moved in front of or behind other windows on the screen, and resized to display more or less information. All of this may be done by means of gadgets – small graphical symbols around each window's borders that represent these functions. Windows may be nested hierarchically inside each other by means of drawer icons. Whenever a drawer icon is opened, a new window is drawn with its own icons within it.

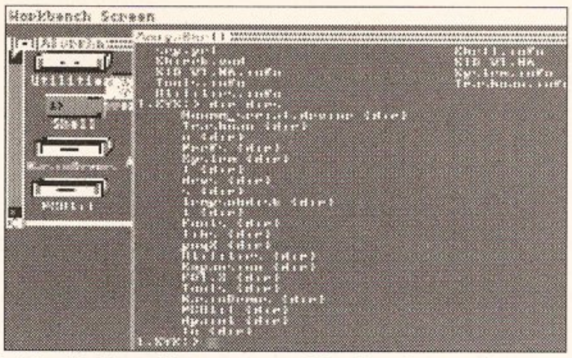
Icons are accessed with the screen pointer, which is moved across the screen by moving the mouse across the desk. Once the pointer is above an icon, that icon can be accessed by pressing the left mouse button twice in quick succession (a process termed 'double-clicking'). The effects of this will vary depending on the icon in question: in the case of a disk or drawer icon, a window will be opened; in the case of a program (or 'tool'), the program will be loaded from disk into RAM and run (in other words, the Amiga will start to follow the instructions contained in the program); clicking on a data icon (or 'project') will result in the data's corresponding program or tool being loaded from disk along with the data on which it will begin to operate. The pointer is also used to control a window's gadgets, but in this case the left mouse button need only be pressed once.

A special type of icon that you should be aware of is the 'trashcan' icon. Other icons may be moved inside here by placing the pointer above them, pressing and keeping pressed the left-hand mouse button, and moving the pointer and icon until they are above the trashcan. Releasing the mouse button results in the icon being dumped in the trashcan. The contents of the trashcan can be revealed by clicking on it in the same way as you would click on a drawer icon. The difference is that the trashcan may be emptied, in which case all of its contents are gone for good. Handle with care.



A system requester, giving a chance to reconsider.

Menus are another innovation of the WIMP system. Menus are a list of options displayed in a text box, selected by means of the pointer. In this way, more complex operations can be performed with the mouse and without recourse to the keyboard. When first switched on and with Workbench loaded in RAM (Workbench is the part of the Amiga's operating system which is not held permanently in ROM), a basic set of menus are available which enable you to do such useful things as copy disks and so forth. Most programs have their own custom set of menus, relating to the particular things that the program is used for.



The Shell provides a command-line interface to the Amiga, similar to that used on IBM PC-compatibles.

Menus are displayed at the top of the screen. Pressing the right-hand mouse button (and keeping it pressed) reveals the title of each available menu in the white bar at the top. Moving the pointer up to one of these titles (with the mouse button still pressed) will cause the Amiga to display the list of options in a box beneath the title. As the pointer is moved down this box, each of the options will be highlighted in turn. Releasing the right-hand mouse button with one of the options highlighted will result in that option being executed.

Although not mentioned in the WIMP acronym, another aspect of the system is the 'requester'. A requester is a box that appears on the screen during an operation – usually a dangerous one such as erasing a disk – displaying a small amount of text and asking the user for what is normally a yes or no reply. In the case of erasing a disk, the text will say 'Ok to initialise volume [name of disk] (all data will be erased)?'. Two gadgets are displayed, one with 'Continue' written in it, the other displaying 'Cancel'. The option you want is selected by moving the pointer over the relevant box and pressing once on the left-hand mouse button.

MULTI-TASKING

One of the Amiga's special features that you've no doubt heard about is multi-tasking. The Amiga is unique amongst home computers in having this feature; in fact it's not until you begin to look at computers very much more expensive than the Amiga that you will normally find such a thing.

But what is it? Basically, multi-tasking is the ability to run more than one program at the same time. This may not seem like a big deal: after all, there is only one of you controlling the thing, and you can't control more than one program at a time. There are advantages to multi-tasking, though.

At its simplest, multi-tasking allows several programs to be running in memory, waiting for you, the user, to use them. You can be working on one of these programs, a word processor for instance, and suddenly realise that you need to do some mathematics so that you can put the answers to some calculations in your document. Ordinarily, you would have to quit out of the word processor, load up the calculator program (OK, I'm assuming you don't have a pocket calculator, but you get the idea), do your sums and write down the answers, then quit out of the calculator and load your word processor again, load in your document, find where you were in it and type in the answers from your piece of paper. Quite a hassle. With the Amiga, the calculator could have been waiting in the background all along, eager to help you out. A couple of mouse clicks brings it into action, and you can get your results there and then. Again, a couple of mouse clicks brings back the word processor, exactly where you left it. With more sophisticated software, you will often find that the data can be directly transferred from one program to another, saving you even more work.

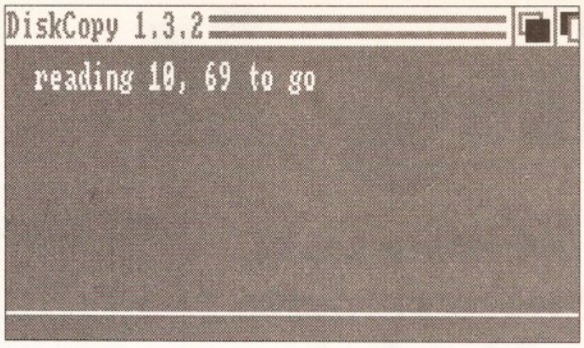
Another advantage of multi-tasking is in running programs which require little or no user input. For instance, you could set a landscape generator going, and meanwhile get on with adding up your family accounts or whatever.

Theoretically, there is no limit to the number of programs you can have running at once. In practice, the number is limited by your available memory: each program requires its share. Also, the more programs that are running, the slower the machine becomes overall. This is because of the way multi-tasking works.

The central processor of a machine like the Amiga can only do one thing at a time. A part of the Amiga's operating system known as Exec (for Executive) decides what the processor will do next. It looks at all of the programs running, and gives each of them in turn a little slice of the processor's time. This swapping from one program to another

happens so fast that all of the programs seems to be running at once. It's all very clever, especially when you consider that Exec itself is just one amongst the many programs running in this way.

To be fair, there are a couple of disadvantages to multi-tasking. The first is that it is often unnecessary. It *can* be useful, but ore often than not you will want to use your computer for one job at a time. But because multi-tasking is such a complex business, it means that the Amiga's operating system is much bigger and complex than it might otherwise be. And this means that it is more likely to fall over occasionally, which leads us on to the second disadvantage: crashing. On mini and mainframe computers, which as well as being multi-tasking also support several users, each program is well protected from all of the others running at the same time. That way, if one program crashes, the rest can go on unharmed. With the Amiga, though, this is not the case. It is possible for a rogue program to effect any others that may be present. In general, if one program crashes on the Amiga, they all crash and the machine has to be re-booted. If you've been entering your accounts for the last hour and a half when your Mandelbrot program decides to crash, all of your typing will be lost. This is one good argument for saving your work to disk at regular intervals.



The display you can expect when copying (duplicating) a disk. A disk is divided up into 80 cylinders, most of which

COPYING DISKS

The first thing that you should do after unpacking your new Amiga is to make copies of your Workbench and Extras disks. This advice also applies to any other disks that you get – although most games and some serious software won't allow you to do this in the interests of preventing piracy.

Copying disks is a good idea because disks have a tendency to get corrupted and lose whatever is stored on them from time to time. Always use the backup copies that you have made, and store the originals in a safe place against the eventuality that your backups fail.

Copying disks on the Amiga is easy, although if you only have one disk drive it can take a little bit of time. In the following description, I'll assume that you only have one floppy disk drive.

First, boot the machine up as normal (this simply means 'switch it on and put in the Workbench disk when you are told to do so'). Then insert the disk that you want to copy. Move the pointer over the disk's icon, and click on it once with the left-hand mouse button. The icon should change colour. Now, using the right-hand mouse button, go to the Workbench menu at the top of the screen and select the Duplicate option. A requester will appear asking you to replace the Workbench disk. Do this. There is no need to click on the 'Retry' box (although you can if you really want): the Amiga will realise when you have inserted the correct disk.

You will then be asked to insert the disk that you want to copy. Having done this, you will be asked to insert the 'SOURCE' disk. Actually, this is exactly the same as the disk that you want to copy. If you are sure you have inserted the right one, click on the Continue gadget in the requester with the left-hand mouse button. The Amiga will start reading the information from the disk, keeping you informed as to how much of the reading it has done and how far it still has to go.

After a time, you will be asked to insert the 'TO' disk. Insert a spare disk, but be sure that there is nothing on it which you want to keep, since all of its original contents will be lost. Once this disk is inserted, click on the Continue gadget. The Amiga will start writing the new information to the disk.

Once this is done, you will be asked to insert the SOURCE disk again. This process of swapping disks will continue until the whole of the original disk has been read and susbequently written to the new disk. After this, the new disk will be named as 'copy of [name of original]'.

It is usually a good idea to rename the disk as something more sensible. To do this, select the disk by clicking once on its icon with the left-hand mouse button, then go to the Workbench menu and select the Rename option. Delete the text of the old name in the box provided, and then type in the name by which you want to refer to the disk. When you are done, press the [Return] key and the whole process is finished.

THE SHELL

Although most things that would ordinarily require a keyboard can be done on the Amiga using the mouse and WIMP system, there are nevertheless hidden depths which can only be accessed by means of good old typing. These functions are performed by using the Shell, which has an icon that looks like a miniature window.

Older versions of Workbench (version 1.2 and below) don't have a Shell. Instead, they have a CLI (standing for Command Line Interface), which works in pretty much the same way but lacks some of the Shell's more advanced features and is therefore a bit more awkward to use. The CLI's icon looks just like that of the Shell, and may be found in the System drawer of the Workbench disk. If it is not visible, the Preferences icon must be clicked on (inside the Preferences drawer). Once loaded, Preferences will display a screen-full of options, one of which will refer to the CLI. Click on this, and next time you look in the System drawer the CLI will be there, ready and waiting.

Clicking twice on the Shell or CLI icon will open a text window on the screen. It is generally a good idea to enlarge this window so that it takes up all of the screen, since a lot of text can be generated when you are working here.

A full description of what can be done in the Shell is really beyond the scope of this section, but we'll give you a quick taster. One of the most used commands is the 'directory' command, which gives a list of files (programs and collections of data) on a disk. When the Shell opens, you are presented with a 'prompt' inside the window. At this prompt, type the word 'dir' and press the [Return] key.

The disk will whirr, and you will be given a list of all of the files on the disk. You may be surprised to find that there are a lot more files than there are icons when viewed from an ordinary window. For a file to be shown as an icon, it must have a corresponding file with the same name but followed by the characters '.info'. This second file contains information about the icon, such as what it looks like, what kind of file it represents, and where on the screen it should be displayed.

Some filenames have the characters '(dir)' after them. This is not part of the name, but an explanation that the file in question is not a file at all but a directory. A directory is exactly the same as a Workbench drawer. Things are held within it. For example, on the Workbench disk there is a directory called 'c' (standing for 'commands'). This is not visible except from the Shell, because there is no corresponding 'c.info' file and therefore no icon. To find out what is in this directory, type 'dir c' and press [Return]. What is displayed is a list of files. In this case, each of them is a program which you can run by typing its name in at the Shell prompt. If you look closely, you will find a command called 'dir', which is the one you have been using to look at the Workbench disk's contents. For more information about the Shell, check out Mark Smiddy's monthly AmigaDOS column. AS

IN NEXT MONTH'S ISSUE...

Every month in *Amiga Shopper* we print 16 pages of Amiga Answers – answers for everyone from beginners to experts. If you have a question, fill in the form on page 50 and pop it in the post to us.

Amongst the questions we intend to answer in next month's issue are the following:

- **"Can I use a plotter with Workbench? Is there a printer driver available?"**
- **"Doctor, doctor! My bootblock has gone funny. Do you think I have a virus?"**
- **"Is it possible to buy a device which enables the parallel port to be shared between two devices?"**
- **"Just how good is the Amiga in educational applications? Is it sensible to use emulators to gain access to the widest possible range of programs?"**
- **"High density, extra-high density, tracks-per-inch...aghh! Which floppy disks should I buy?"**
- **"Is it true that I have to throw away my old chips if I want to increase the capacity of my RAM expansion?"**
- **"All of the programming examples for accessing the Amiga's graphics functions are written in C. When I try and do similar things in assembler, my machine always Gurus. How do I go about it?" – Paul Overaa, the code demon, gives a hugely in-depth account of assembly language with libraries, screens, rectangles and floods.**

Smoothing it



This month Gary Whiteley looks at three different video products. First off, he looks at two font smoothing utilities

It's about time! How many of you spend ages scrupulously cleaning up all the jagged edges on your text or fonts by hand? How many of you have already tried it and given up in disgust? Well, I'm glad to say that from now on your jaggy problems will be solved by using one of these new font anti-aliasing programs.

Why is anti-aliasing so desirable? For one thing it makes your product look much more 'professional'. And that's important when you need to produce good looking captions for your video – be it for broadcast TV or to show the family. So how do you make it happen without editing your text dot-by-dot or painstakingly smoothing out fonts with something like *Calligrapher*? Easy – use Zen's *AntiA* or InnoVision's *Font Enhancer* program.

ANTIA

AntiA was masterminded by Martin Kay, a TV professional who uses Amigas regularly with Granada Television in Manchester. He wrote the program to fulfill a need he had in his own work.

AntiA works by reducing the size of any Amiga bitmap font and calculating where to put the anti-aliasing on the new typeface produced. It then produces an eight-colour ColorFont which can be used by any software capable of supporting ColorFonts. AmigaDOS 2.0 supports ColorFonts directly. Other users will require a program called *ColorText*, which is supplied with *Deluxe Paint*, amongst others). *Broadcast Titler 2* owners will also be glad to hear that the results of *AntiA* convert very well into .btf format fonts for use with *Broadcast Titler 2*, using the *Font Convert* program supplied with it.

Using *AntiA* is very easy. Select the font you wish to convert, decide where you want to save it, choose your size or sizes and select Convert. *AntiA* will then set about providing you with a crisp, professional-looking set of ColorFonts.

That's it in a nutshell. But you get more than that for your money. You can be more refined – setting upper and lower size boundaries for your font (to save disk space), determining the colour palette usage for the aliasing, making directories to save the new fonts to and making sure that all the resulting font and .font files are correctly saved by sorting out the .font directories.

Size reduction can be from a choice of nine presets ranging from 1/2 to 1/12 original size – a large enough range for most people, since size also depends on the size of the original font. As an example, a 120-pixel high font would become 60, 40, 30, 24, 20, 17, 15, 12 and 10 pixels high respectively. Multiple reductions can be made in one operation by choosing the required sizes and then letting *AntiA* get on with the crunching.

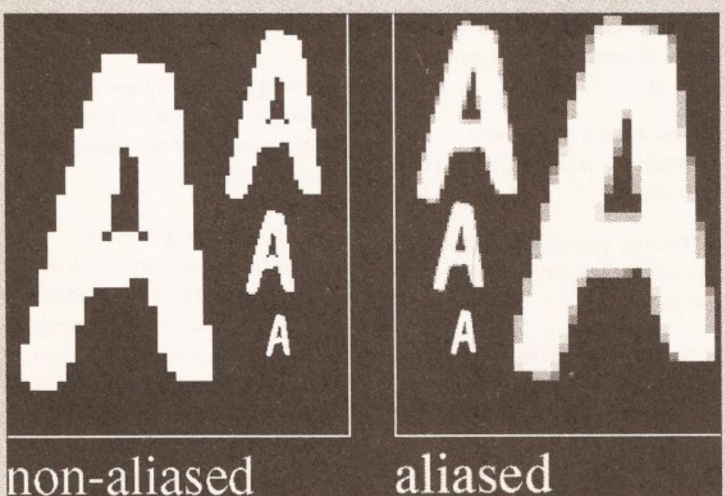
It is not possible to make sizes larger than half of the original font size due to the way the anti-aliasing algorithm works. If you wish to have a 120-pixel size anti-aliased font you will have to start with a bitmap font 240 pixels high, which is possible by using the CreateFont utility supplied with *Professional Page 2*.

Results-wise, *AntiA* does its job very well, though there are one or two fonts I've come across which didn't look as good as I would have expected. Still, it works quickly and efficiently and usually with no problems. If you use lettering regularly for video titling applications, or you want your video graphic output to look even better, try *AntiA*. All the fonts produced by *AntiA* are ColorFonts, so they can be used with any program which accepts bitmap fonts – as indeed most do.

A final note – fonts produced by *AntiA* look best in Hi-Res mode and do not work in HAM applications. *AntiA* will work on a 512K Amiga, but the size of fonts you will be able to use will be restricted. Otherwise, any Amiga can be used.

ANTI-ALIASING

If you're wondering what anti-aliasing is, take a look at the illustration. Look at the jaggy edges of the magnified letter A on the left. Then look at the edges of the letter A on the right. OK, they still look steppy, but that's only because they've been blown up to show the principle of anti-aliasing. See the various grey pixels which surround the right hand A? That's anti-aliasing. A way of making the steppy edges of screen-based graphics look smoother.



BT 2 FONT ENHANCER

This one has been a long time coming. And now that it has arrived I fear that it is possibly too late.

As with *AntiA*, the purpose of *Broadcast Titler 2 Font Enhancer* is to make anti-aliased fonts. But *Font Enhancer* is dedicated for use with *Broadcast Titler 2*, producing fonts in InnoVision's proprietary .btf format. And while these fonts do undoubtedly take up less disk space, they are essentially useless to every program other than *BT2*.

Anyone familiar with *BT2's Font Converter* utility will have no problems using *Font Enhancer* – so unless you're just starting with *BT2* you should have no problems running the program. If you have *Font Converter* installed on your hard disk, *Font Enhancer* will replace it when it is installed using the *HDInstall* program supplied.

Except for the price, and other than making .btf fonts only, the main difference between *Font Enhancer* and *AntiA* is that *FE* can make any size of font from a bitmap font (though the best results will be obtained at 100 per cent or any size below 50 per cent). Up to 11 fonts can be converted in a single batch, as long as all the fonts are in the same disk directory. This means that batch processing is just not possible on a single drive Amiga.

FE also supports the generation of fonts for *BT2's* Super Hi-Res mode. This can only be used by Amiga 3000 owners (or those lucky enough to have the ECS upgrade in their older models) and InnoVision's Super Hi-Res upgrade to *BT2*.

CHECKOUT ANTIA

Documentation ●●●●○
All you need to know, in plain English.

Ease Of Use ●●●●○
Dead easy.

Quality ●●●●○
Usually very good.

Speed ●●●●○
Nippy.

Price ●●●●○
A bargain at £40, especially compared to *BT2 Font Enhancer*!

Overall rating ●●●●○
Great – a very useful utility.

This will result in a doubling of the Amiga's horizontal resolution and increase the quality of the text.

The selection sequence of *Font Enhancer* is rather long-winded – with several menus and screens to pass through – and the processing is slow. The results are good though and they work well with *Broadcast Titler 2*, (although not with other software).

To use .btf fonts with other programs you would have to save an IFF picture from *BT2* of the lettering, then export it to another program such as *Deluxe Paint* for display. To make a font you would need to clip all the individual letters out as brushes and load them one by one into a font editor such as *Calligrapher*. Then space them all out correctly and save them as a ColorFont. Then you could use them as a bitmapped font.

Conversely, it is much easier to use *AntiA*-converted fonts with *BT2* by running them through *BT2's Font Converter*. It takes just as long as *Font Enhancer*, and although you don't get the range of sizes as easily, it works fine and you already own *Font Converter* if you have *BT2*.

TIPS

- Neither *AntiA* nor *FE* will convert existing ColorFonts into anti-aliased fonts.
- If you have a font editor, you could make logos and save them as letters of a font then anti-alias their edges with *Font Enhancer* or *AntiA*.
- Large bitmap fonts for conversion give better results than small ones.
- Anti-aliasing will not markedly improve fonts with very jagged edges. Use well-designed fonts for the best results.

SHOPPING LIST

AntiA..............................£39.95
by Zen Computer Services
From Alternative Image
6 Lothair Road, Aylestone
Leicester LE2 7QB
☎ 0533 440041

Font Enhancer.................£129.95
by InnoVision Technology
From HB Marketing Ltd
Unit 3, Poyle 14
Newlands Drive
Colnbrook, Berks SL3 0DX
☎ 0753 686000

CHECKOUT FONT ENHANCER

Documentation ●●●●○
Good, comprehensive and understandable.

Ease Of Use ●●●●○
Pretty straightforward – if all you need is .btf fonts for *Broadcast Titler 2*.

Quality ●●●●○
Good – no worries..

Speed ●●○○○
Plodding. And an accelerator won't help either.

Price ●●○○○
Before *AntiA*, £130 would have been acceptable as nothing else did anti-aliasing. Now, it's too much!

Overall rating ●●●○○
Certainly a quality piece of software for those with cash, but I think that *AntiA* will be the people's choice, since it offers almost everything that *Font Enhancer* does (and in some respects more) and at a significantly lower cost.

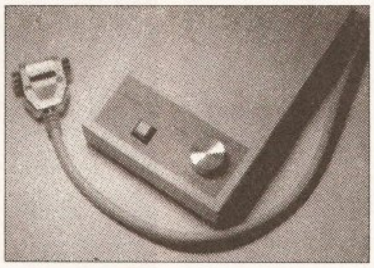
COMPARISON CHART

Feature	AntiA	Font Enhancer
Multitasking	Yes	No
Maximum Font Size		
Input	300 pixels	200 pixels
Output	150 pixels	200 pixels
Batch Processing		
Various Fonts	No	Yes
Various Sizes	Yes	Yes
Output Format	ColorFont (1)	.btf font (2)
Audio Warnings	Yes	No
Speed (3)		
160 point, 95 chars	75 seconds	660 seconds
120 point, 128 chars	90 seconds	810 seconds

Notes:
1 Eight-colour Amiga bitmap font.
2 InnoVision proprietary font format.
3 Speeds were for converting two different fonts to 20 point.

Quick and easy genlocking

Gary Whiteley investigates a low-cost genlock from Rocgen



If you want a VHS-quality, low-cost genlock, Rocgen's offering may well be just what you're looking for.

The first thing I didn't like about the Rocgen genlock was that there was no pass-through for the RGB signal from the back of the Amiga to the Amiga monitor. Instead I had to connect to the video out from my record VCR. The other things I didn't like were the audio-style phono connectors for the video signals in and out. I always like a trusty BNC connector, myself.

But that was all I could really fault on this budget-priced genlock. Easy to hook up and use and delivering a picture which was certainly good enough for VHS, I would say that the Rocgen is aimed at the domestic/amateur market.

Around the size of a thickish paperback book, the Rocgen RG3000C is Amiga-coloured, and has a simple control panel layout – one switch and one knob. Connectors are for RGB from the Amiga, video in, video out and 12 volt external power supply (not included). There's also a switch to tell the Rocgen whether it is receiving its power from the Amiga or the external power supply unit.

HOW DOES IT DO?

Surprisingly well. By using the switch to select between Overlay, Fade or Amiga you set up the picture options. Overlay is for superimposing Amiga graphics over video, Fade for cross-fading between graphics and video, and the Amiga setting provides straight graphics output only. The rotary knob is used to fade between video and Amiga when set to Fade, and to fade the Amiga graphics up and down over video when set to Overlay. I was pleased that the Rocgen does fade properly, rather than fade to black first.

It does need driving with video all the time, though – and the better the video goes in, the better it comes out – as the Amiga picture tends to become smeary otherwise. This is where the RGB pass-through would have improved matters.

The genlock picture quality is really not at all bad for a unit of this price. Colour saturation seems to be a little low and there appears to be nothing the user can do about this. But overall stability is pretty good, although I did see the picture jump occasionally.

THE VERDICT

You shouldn't expect broadcast quality from the Rocgen. Nevertheless, in non-critical situations this genlock should certainly do the business for you. And, of course, it will work with any Amiga, not just an A2000 or A3000.

SHOPPING LIST

Rocgen Genlock RG3000C.........
.......................................£119

From Silica Systems
1-4 The Mews
Hatherley Road, Sidcup
Kent DA14 4DX.
☎ 081-308 0888

CHECKOUT ROCGEN GENLOCK RG3000C

Documentation ●●●○○
Basic setting up instructions.

Ease Of Use ●●●●○
Simply set up and controlled.

Features ●●●○○
Shame about the lack of RGB pass-through.

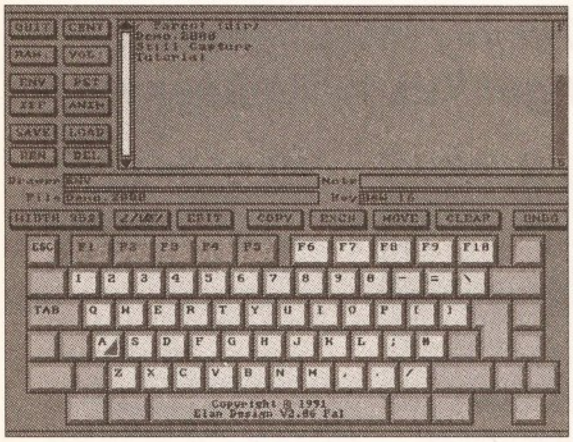
Quality ●●●○○
For the price, very good.

Price ●●●●○
For the quality, £119 is very good.

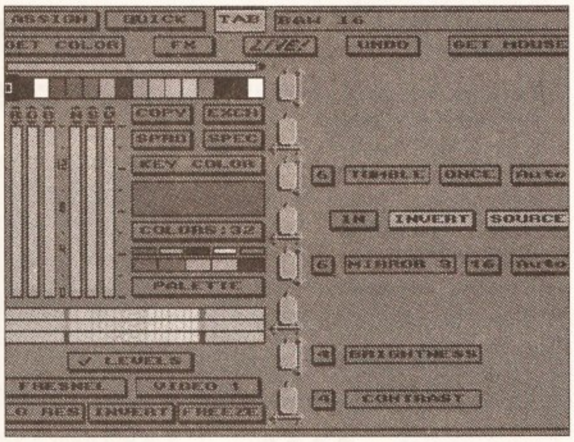
Overall rating ●●●●○
A genlock well worth considering if your budget is very tight.

Invision

Invision has been around for some while in various guises. So is its latest release worth the money?



The business end of *Invision Plus/Live!* Choose it, load it, name it, save it, edit it and then go Live!



The palette menu allows you to change the colours to your heart's desire.

Back in February 1989 *Amiga World* carried an advert for a new software product from Elan Design. Called *Invision*, it was touted as being the only software allowing capture, processing and display of video effects instantly and continuously in real time.

But since these tasks cannot be done by software alone, it was also necessary to own *Live!*, the frame grabber from A-Squared. Total outlay then – around $480.

Now it's grown up, it's here in the UK and it's all in one box. The bundled package contains a PAL version of *Live!*, the *Invision Plus* software and a snazzily-designed manual. The total cost is £579 + VAT.

So what does *Invision Plus/Live!* do? Well, quite a lot actually. From grabbing sequences of video frames to caption superimposition. From colour effects and image compression to special effects and animation playback over video. It will even capture still frames. All actions can be programmed and controlled via the mouse and the keyboard in real time, with plenty of flexibility. But there are notable output quality problems which will not endear this product to many video users.

The version of *Live!* which I tested was an internal unit for the Amiga 1500/2000/3000. There is no version available for Amiga 500 or 1000 owners, though NTSC versions of *Live!* can still be bought in the States for these machines.

QUICK FIT

Installation is easy – if you can use a screwdriver you can install *Live!*. Simply pop it into any available expansion slot (not the video slot). Then prepare your video equipment. *Live!* has facilities for two video inputs and two loop outputs (to pass the inputs through to other devices). It has no video output itself, relying on the Amiga for this, so if you want output to devices other than the Amiga monitor – and I think you will – then you'll also require a genlock or RGB-to-video coder. Connect a couple of cameras or video decks (actually one input will do, but two is more fun!) to the back of the board and we're almost ready to roll.

And just before you say "Aha, gotcha!" and wonder why I've not mentioned time base correctors yet, the reason is that *Live!* will handle VCRs without needing TBCs. So there.

Finally, make sure that the two 75 ohm termination switches (accessible from the rear of the Amiga) are correctly set. If the video signal terminates at the *Live!* board, then the corresponding switch should be set to 75 ohm termination. If the signal loops through then the termination should be off at *Live!* and on at its final destination. This is to ensure that the video signal is properly balanced.

KEYBOARD EMULATION

Firing up the software is simple – *Invision Plus* can be run from either floppy or hard disk. The first screen we are presented with is an emulation of the Amiga keyboard,

BLITS & BOBS

"Television is chewing gum for the eyes" – Frank Lloyd Wright

with loading and saving, edit and other facilities. It is from here that all the parts of *Invision Plus/Live!* are accessed. So you could simply run *Live!*, if you wished, or edit the functions of each keyboard or mouse key, load a new keyboard environment or load a picture or anim and assign it to a key. Anims and pictures and other items can also be saved from this screen and you can choose overscan width (352 or 368 pixels) and centre the screen display using the mouse.

The software is very much like *Elan Performer* (also by Elan Design, of course) in the way that keys can be 'programmed' to have their own individual features. For instance, you might like the 'A' key to make the incoming video picture on Input 1 have a red and green 32-colour low-resolution palette, be turned upside down and displayed at quarter size. Furthermore, the mouse could be made to control contrast and brightness, picture position on screen, colour saturation and other characteristics when different combinations of buttons and movement are made. All these options would be applied when the letter 'A' was pressed on the keyboard. Other keys can be

THE EFFECTS

Here's a list of the effects that Invision Plus/Live! can do...

- **Blank – blanks the screen to the colour of your choice.**
- **Blinds – a Venetian blind effect.**
- **Blinds 2 – wipes the moving image on or off screen.**
- **Colours – various colour parameters.**
- **Cycle – colour cycles through all the colours in the current palette.**
- **Expand – expand an image over width or height.**
- **Fade – fades moving image to black or white.**
- **Freeze Frame – grab and hold image on screen until key press.**
- **Fresnel – a bevelled glass effect.**
- **Inset – puts a quarter screen image on screen.**
- **Invert – flips the image upside-down and then back again.**
- **Mirror – creates a vertical mirror image within the display.**
- **Mirror 2 – moves a mirror up the screen to top or in reverse.**
- **Mirror 3 – another bevelled glass type of effect.**
- **Mosaic – produces a blocky, pixellated mosaic.**
- **Nuke – a "radioactive glow" effect using reversed colour cycling.**
- **Scan – a progressive line grab, freezing the image line by line.**
- **Screen Position – screen can be moved up and down with mouse.**
- **Slide – slides one image across another.**
- **Squeeze – squeezes the width of the moving image.**
- **Stretch – stretch or compress a moving image vertically.**
- **Strobe – controls video grabbing rate.**
- **Supergen – dissolve between live and affected imagery (using SuperGen).**
- **Tiles – divides screen into four or 16 identical tiles.**
- **Trails – leaves colour trails behind the moving image.**
- **Tumble – two levels of picture flipping.**
- **Zebra – two-colour contrast striping effects.**
- **Zoom – instant zoom into a quarter of the image**

Plus/Live!

programmed to do anything you like (within the confines of the software, of course) and the mouse can be reprogrammed by any key which has mouse commands attached to it. With a little practice, getting to grips with this system is a lot easier than it might sound.

You could set up all the keys on your keyboard and then save the whole lot as a file. Other files could be built up and then you'd be able to have as many effects as you could think of – quite literally at your fingertips.

The scope of mouse commands is quite extensive when you think of all the possible combinations of two buttons (separately, together, up or down) and then further combinations involving mouse movement, direction and distance. And all the changes are made 'live' on the selected video source(s).

Further examples of possible key programs include grabbing sequences into memory – with size being limited only by available memory – making all kinds of alterations to the colour palette, freezing the current frame, doing a transition from one source to the other, making the image black-and-white and so on.

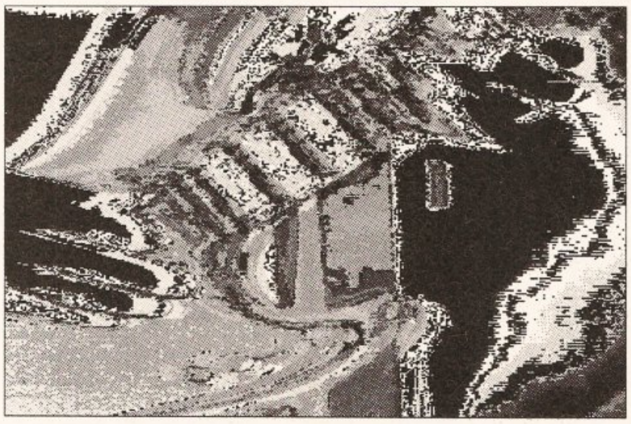
Captured sequences and pictures can be saved to disk as anim and IFF files respectively, although the compression into an anim can be very slow. Grabbed sequences can be immediately played back from the key they were captured on, as they are held in RAM, and can be edited by using the mouse and keyboard.

On the plus side, there are a lot of possible combinations. On the minus side, however, because of the low resolution of *Live!* most of them look fairly awful.

SLOW GRABBING

There is also a way of using grabs made with *Invision Plus/Live!* to produce still frames in 16-colour high-res or 4,096 colour HAM. The technique varies slightly depending on the video device you are capturing from – VCR, colour or black-and-white camera – but will always involve grabbing one or more frames from video, saving them to disk and then running the separate *Still Capture* software provided.

I say frame or frames because *Still Capture* can work on one grabbed frame only or on several to produce an average. One frame will only produce a monochrome result, so it is necessary to save at least three frames (one each for red, green and blue) to produce a colour image. More than one frame of each of R, G and B can also be saved so that *Still Capture* can take an average for more accurate reprocessing.



If wacky pop videos are your 'bag', and you want psychedelic effects then the *Invision Plus/Live!* system could be for you.

If you use a black and white camera it is necessary to use a colour filter for each frame of R, G and B. If you use a colour camera or VCR (with rock-solid still frame) then you have only to press the appropriately set R, G or B capture buttons on the keyboard, causing filtered colour grabs to be made.

The results are saved as anim files (or single IFFs for quick processing) and *Invision Plus* is then quit. *Still Capture* is run and you will be asked to supply the names of the R, G and B files you wish to process. Processing commences and the final result of the RGB combination is produced.

The worst part about this whole business is that it takes a while to do (*Still Capture* takes ages to process the RGB files) and the results are pretty poor. I did a direct comparison with *DigiView 4* and there is no competition – *DigiView* wins hands down on the grab front.

I didn't bother trying to grab high-res images as this is even more complex and involves grabbing left and right halves of the image and then combining them back together again to make a whole picture. What a palaver!

Note also that *Still Capture* averaging requires a minimum of 2Mb of RAM.

THE REST

For the sake of completeness I should tell you that *Invision Plus* can also control Digital Creation's SuperGen genlock, allowing remote effects such as dissolving between live video and affected imagery. However, as far as I know the SuperGen is not available in PAL, so this feature won't be of great use to most of us on this side of the pond.

VIDEO STARS

The problems lie almost exclusively in the output quality of the system. *Invision Plus/Live!* would be great for pop videos, discos and raves with live video systems, and, more seriously, some of those scientific disciplines dependent on false colour imagery. But for those who require good quality video output with real-time effects this is not the way to go. It would be better to stick to the established video options or wait for the Toaster.

While *Invision Plus/Live!* is certainly a lot of fun to use and can be a valuable artistic tool under the right circumstances. Otherwise, I have to say that I think it's a high price to pay for a system which often reduces your precious video images to a blurred pulp. AS

SHOPPING LIST

Invision Plus/Live! ....£579 + VAT

From HB Marketing
Unit 3
Poyle 14
Newlands Drive
Colnbrook
Berks SL3 ODX
☎ 0753 686000

CHECKOUT
INVISION PLUS/LIVE!

Documentation ●●●●○
Nicely presented and generally authoritative manual.

Quality ●●○○○
As video processing equipment goes, this really isn't that good.

Software ●●●○○
It's OK, but not great. The key programming is a good idea.

Hardware ●●●○○
Again, OK but not great. Poor resolution and colour hamper widespread application.

Ease Of Use ●●●●○
Relatively easy to use when you know where all your key functions are.

Price ●●●○○
£579 + VAT makes this an expensive box of tricks. If the quality was better this might be justified.

Overall rating ●●●○○

Sure, it does things that the Toaster doesn't, but the quality and contents are far from those of the Toaster. My money will be staying in the bank. That said, if you want crazy psychedelic effects for pop videos, discos or other streetlegal uses, check it out.

SPEED VS COLOUR

Since Live! converts video to graphics, there is a trade-off between the number of colours in the graphics palette and the speed at which Live! will process video.

Bitplanes (lo-res)	Colours	Frames/Second	Colours (hi-res)	Frames/Second
1	2	50	2	25
2	4	25	4	12.5
3	8	17	8	8.5
4	16	13	16	6.5
5	32	10	N/A	–
6	64	8	N/A	–

Figures given refer to low-res. High-res will be correspondingly slower. 64-colour low-res is the highest number of colours available.

AMIGA

A1500 from £625!

Prices include VAT, delivery & warranty. Please add £15 for overnight delivery. All systems are tested before despatch. On-site maintenance options available.

Amiga A3000/100, 25Mhz 6MB	£2995
Amiga A3000/50, 25Mhz 3MB	£2795
Amiga A1500 latest UK model	£625
Amiga A1500 as above plus DPaint3, Works Platinum etc	£675
Amiga A1500 with A2088 PC-XT bridge board & 5¼" disk drive	£825
Amiga A1500 with A2091 and 50MB Quantum 11ms autoboot hard disk	£1049

A1500 + XT Bridge Board + 20MB autoboot hard disk £1095!

PERIPHERALS AMIGA

RAM for A590, 80ns, per MB ...	£36
KCS PC Power Board ...	£220
SupraModem 2400 Hayes/AA/AD	£115
SupraModem 2400 Plus MNP/v42	£185
SupraModem 2400zi Plus internal	£169
MultiScan monitor 14" 1024x768	£395
A2320 Display Enhancer for above	£249
HP DeskJet 500 inkjet, 300 dpi	£445
HP PaintJet colour inkjet 180 dpi	£845
Rendale 8802 Genlock ...	£159
Rendale Super 8802 SVHS	£525
Rendale Pro Genlock ...	£575
ColorBurst 24-bit card	£569
SuperPic Genlock/hi-res Digitiser	£495
SketchMaster 18x12 dwg. tablet, 1000 lpi, with stylus & 4-button cursor	£495
A2630 card 25MHz/FPU/4MB	£1295
A2286 PC-AT board & 5¼" drive	£675
A2088 PC-XT board & 5¼" drive	£225
C2058 8MB Board, 2MB installed	£184
RAM for above, per 2MB ...	£72
Quantum ProDrive 50MB 11ms	£275
Quantum ProDrive 100MB 11ms	£425
Quantum ProDrive 200MB 11ms	£725
A2091 card for ProDrive, 2MB 0K	£189
RAM for above, per MB (max 2MB)	£36
External Drive unit for ProDrive	£95

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Wobs and drops

Jeff Walker describes how to use Professional Page to create drop capitals and white text on black panels in this four-page tutorial

We have no reviews this month – instead we'll get down to some practical DTP. There are two questions about *PPage* I get asked more than any other: how to do white-on-black headings, and how to do drop capitals (like the one that started this piece of text). So this month I'll show you how to create those two effects.

WOBS

The white-on-black (wob) heading is a useful layout tool if done correctly.

You need the same amount of black above the letter that sticks up the most, and below the letter that sticks down the most. If the text is all in capitals this presents no problems, but if it includes lower case letters with descenders, wobs can sometimes look as if the text is trying to escape out of the top of the box because there is a greater percentage of black below the initial capital letter of the text than there is below it.

If in such a case you reduce the amount of black underneath the initial letter, the gap underneath the descenders in the rest of the text starts to disappear and gives the impression that the text is falling out of the bottom of the box – Catch 22.

The best way to beat the problem is to compose your wobs with care. For instance, The text 'Do it this way' is awkward because the tail on the lower case 'y' is the only descender in the text – 'How to do it' says the same thing and has no descenders. Alternatively, set the entire text in upper case, ALWAYS REMEMBERING THAT TEXT ALL IN CAPITALS IS FAR MORE DIFFICULT TO READ.

Enough theory, let's put it into practice. We'll look at the obvious method first; this isn't the best or quickest way, but it has some important lessons to teach us.

1 First off, adjust the settings in your Layout Tools (press [Alt]-t) so that you're working in picas; although you may feel that this is an alien measurement system, it makes life easier when working with fonts because one pica equates to exactly 12 points, and fonts are always measured in points. While you're there, switch Snap To Grid on and then click OK.

2 Use the Preferences menu to switch Wireframe Graphics off (no checkmark next to it) and go into 200 per cent magnification (or press [Alt]-w and [Amiga]-1), then drag out a box 18 picas wide and 3 picas deep. (Use the Box tool at the top of the toolbox next to the null pointer button, not the Draw Rectangle tool near the bottom of the toolbox.) Click the Text tool button and then click in the box you've just created. Now use the Type menu to change the typeface to 36pt Triumvirate and select the Bold style – wobbed text should always be bold, for extra legibility.

Select Color from the Type menu and double-click on the White entry in the Text Color requester. Lastly, make sure kerning is switched on, type 'How to do it' and click on the null pointer button.

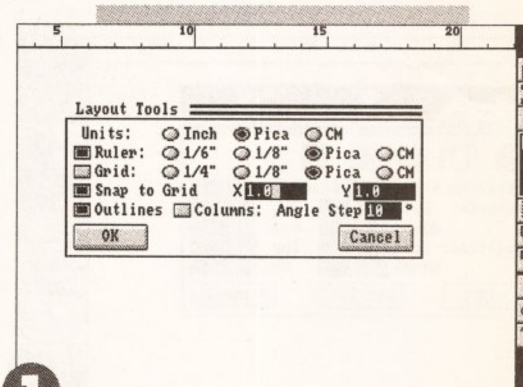
3 If you've followed all that, the text should have disappeared from view This is because we have just typed white words on to a white background.

To make the background turn black, first double-click on the text box to get the Active Box requester up on the screen. Switch the Frame gadget on – that's the gadget on the far right that changes from an empty box to a filled box with a border around it when you select it. Click on the OK button and then select Fill Color from the Draw menu. Double-click on the Black entry.

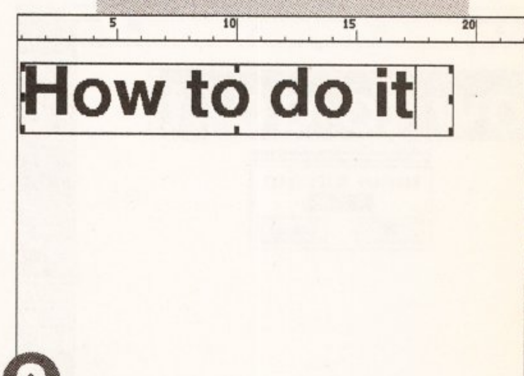
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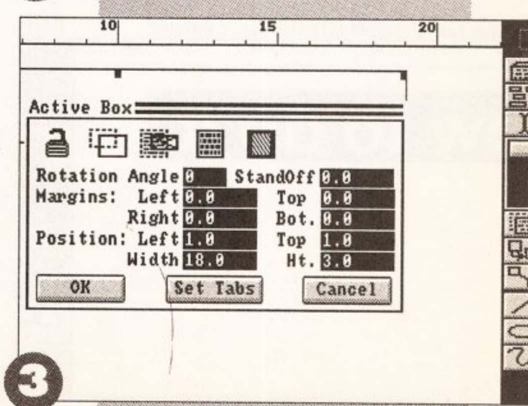
"The two questions which I get asked most about *Professional Page* are how to create drop capitals and white-on-black panels. Well, read on…"
Jeff Walker



1



2



3

JARGON BUSTING • JARGON BUSTING

Ascender – The vertical stroke above the x-height (qv) in lower case letters like d and h.

Baseline – The imaginary line on which both capitals and lower case letters sit.

Body text – The words that make up the main part of a publication.

Cap height – The height of capital letters in a font.

Descenders – The part of a lower case letter that comes below the baseline.

Drop capital – An initial letter set in a larger type than the body text, covering two or more lines.

Layout – The arrangement of text and graphics on a page.

Pica – A unit of typographical measurement. There are 12 points in one pica.

Point – The basic unit of typographical measurement. Roughly speaking, there are 72 points to the inch.

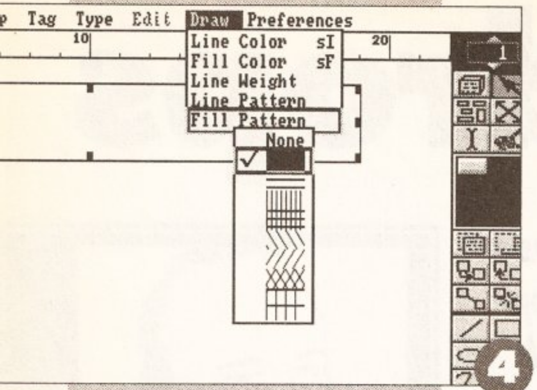
Raised capital – An initial letter set in a larger type than the body text, covering two or more lines.

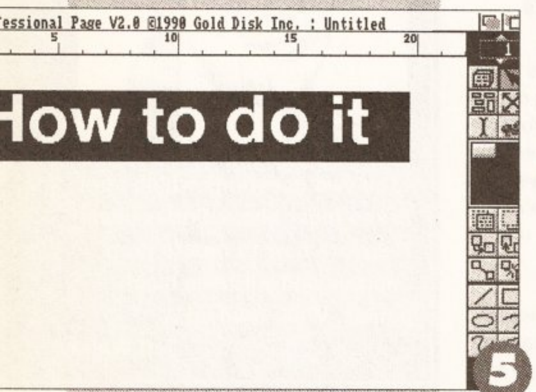
Readability – A function of how type is used. The readability of a page will depend as much upon the layout as on the typeface.

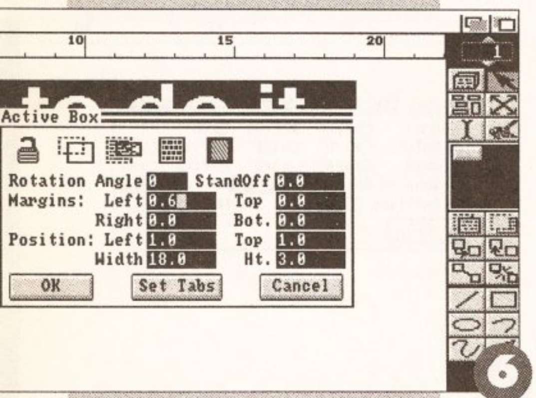
Tint – A flat area made up of dots or lines.

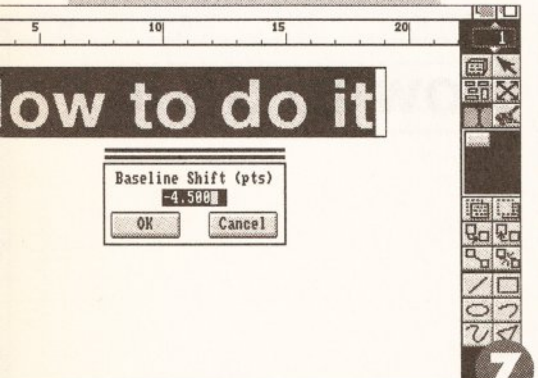
Wob – Acronym for white-on-black; that is, white text on a black background.

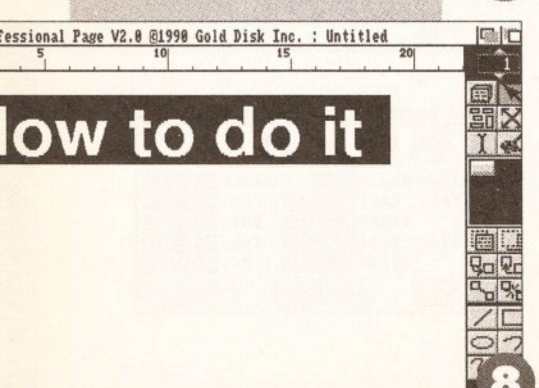
x-height – The height of the lower case letters in a font, measured from the baseline up. In other words, the height of a lower case x.











continued from page 77

4 Nothing has changed yet because we haven't selected a fill pattern – or rather, the fill pattern is still set to the default of 'no fill pattern'. So select the solid black square from the Draw/Fill Pattern submenu. It's important to realise that this doesn't mean 'black fill pattern', it means 'solid fill pattern'.

5 Now you should be able to see your white text on your black background.

6 But there's a problem. The text is nigh-on flush with the left and top edges of the box. The obvious way to remedy this is to insert left and top margin values in the Active Box requester. Half a pica (six points) is a good distance, so double-click the box and enter 0.6 into the string gadgets for the left and top margins.

Note that when using the pica measurement system, the numbers after the dot are points, not tenths-of-a-pica, so 6.8 reads as six picas and eight points. There are 12 points to a pica, so 6.11 is a valid number. If you want to enter a value in points, say 76, and can't be bothered to convert it into picas and points, simply enter 0.76 and *PPage* will calculate it for you and automatically change your entry to 6.4 – six picas and four points.

Anyway, back to the plot. If you've entered the 0.6 pica left and top margins and clicked OK, you will have noticed that your text has disappeared, leaving you with a solid black area on the screen.

There's a reason for this. Even though none of the letters we've used has a descender, each has an area underneath it reserved for a descender. By inserting a 0.6 pica top margin what we have effectively done is reduce the height of the box from 3 picas to 2.6 picas – from 36 points to 30 points, in other words. See why the text has disappeared? It's a 36pt font, so it won't fit in a 30pt box. Fortunately, there is a simple solution: increase the height of the box to 3.6 picas (42 points) and it'll fit again. Yes? Go on then, bring up the Active Box requester and do it.

Hmmm, fine in theory, but it didn't work for me. I had to make the box 3.7 picas high to get the text to appear again. (This seems to be a bug.) And if you now look at the capital 'H' you can clearly see that there is almost twice as much black below it as there is above it. This isn't good enough. But if we reduce the height of the box the text disappears. What do we do?

What we do is adjust the baseline.

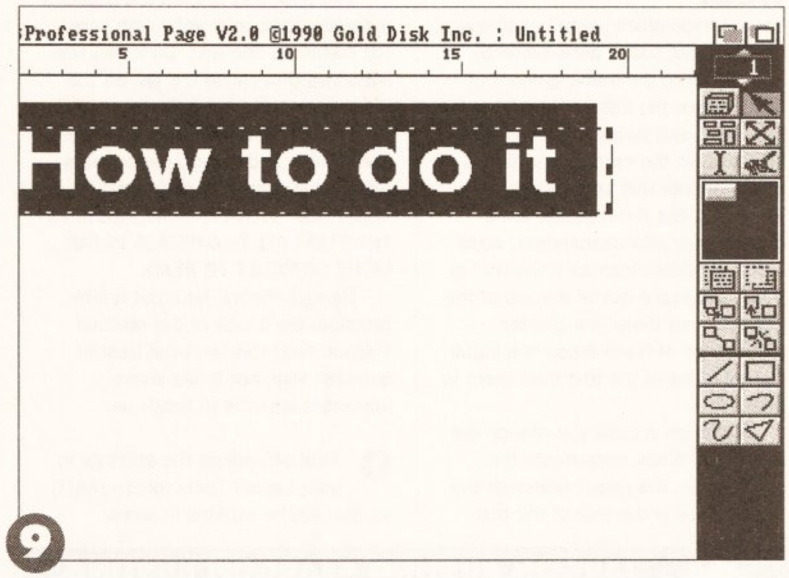
First, though, bring up the Active Box requester again and change the top margin back to zero and the height of the box back to 3.0 picas. Leave the left margin at 0.6. (If you find that the text disappears again after making the above changes, make sure Snap To Grid is on in the Layout Tools requester, use the mouse to drag the box to 4 picas high, let go and then drag it back to 3 picas high. I don't know why this works, but it does.)

7 Now we're going to move the baseline of the text in the box down so that there is as much black above the capital 'H' as below it. We could do this exactly if we knew the 'cap height' of the font (the height of the capital letters); some words about this later, but for the moment it's just as easy to do it by eye.

To move the baseline, click on the Text tool and then click in the box. Highlight all of the text with Select All from the Edit menu (or press [Shift]-[F4]) and press the [Down arrow] key a few times. Every press moves the baseline down half a point; after about nine presses you should be able to see that the 'H' is positioned equidistant between the top and the bottom of the box. Nine down-arrows is -4.5 points, and we could have achieved the same thing by selecting Baseline from the Type menu after highlighting the text and entering -4.5 into the string gadget that appears.

8 And there you have it – your wob.

9 As I said at the beginning, this is the obvious way to do a wob, but there is a quicker and simpler method: use two boxes, one of a solid black fill pattern for the background and the other (with no fill pattern) containing the white text. Then simply plonk the background where you want it and position the white text on top of the black background. This way you can reduce the height of the black area if you need to without worrying about the text not fitting.



Told you it was simpler.

Finally on the subject of wobs, a tip on how to get the approximate cap height of a font. Create a big enough box and type a capital 'E' into it of the desired point size. Switch Snap To Grid off and then drag the bottom edge of the box up until it just overlaps the bottom of the 'E'. Don't worry about the letter disappearing. Now double-click on the box and look at how high the box is. That measurement is the approximate cap height for that font.

I say "approximate" because sometimes there is a small gap between the top of the letter and the top edge of the box – it all depends on the point size and how the typeface has been designed. So before checking the cap height size you should move the baseline up until the top of the letter hits the top of the box.

To give you something to practice with, for a 72pt Triumvirate letter 'E' I had to move the baseline up three points, after which I got a cap height measurement of 4.2 picas, or 50 points. All capitals in that font should

have the same cap height, except 'Q' which has a little tail sticking down. If you decide that you want one pica of black above and below your text, armed with the knowledge that the cap height is 4.2 picas you know that the black box has to be 6.2 picas high – provided that the text has no descenders, that is. If it does, you'll have to recalculate. Watch out for the descenders of 'g', 'j' and 'y', which are often (but not always) a little shorter than the descenders on 'p' and 'q'.

DROP CAPS

Drop capitals are sometimes used at the beginning of paragraphs. They are there for decoration and to immediately draw the reader's eye to the point on the page where the text begins. Like all decorative elements, though, they should be used sparingly for best effect.

Newcomers to DTP often expect a 'Dropcap' menu option – one click and the work is done for you. But there are several ways to treat a drop capital, so any such command would only be able to offer a limited approach to the problem – and Sod's Law dictates that it will be exactly the approach that you don't want.

The obvious way to implement a drop capital in *PPage* is to type a large capital letter into a box of about the correct width and height, make it impermeable by clicking the Impermeable button in the Active Box requester, give it a small standoff, and then place it on top of the body text box at the beginning of the paragraph. Because the drop capital box is impermeable and is on top of the body text, the words will automatically flow around the capital.

The problem is the space underneath the capital that is reserved for the descender. It's usually around one-third the total point size, which for a 72pt font is about a third of an inch. Because the box is impermeable, the body text won't return to the left-hand edge of the body text box until it falls below this area. It looks ugly.

No capitals have parts that fall below the baseline (except for Q, and sometimes J), but if we drag the bottom of the box up so that it is flush with the bottom of the capital, the letter disappears because its point size is greater than the height of the box.

The trick is to move the baseline; let's run through the steps.

1 Go into 200 per cent magnification and create a box 6 picas wide by 6 picas high. (If you're still in inches or centimetres, use the Layout Tools requester to change to picas. Turn Snap To Grid on while you're there.) Six picas equates to 72 points, which is the point size we're going to use for our drop capital.

Click the Text tool and then click in the box you've just created. Change the typeface to Triumvirate, the point size to 72 and the type style to Bold.

Type a capital 'D' and then double-click on it to select it. Now that it's highlighted, you can see the area underneath the letter that is reserved for the descender. You can also see that the letter isn't actually as wide as the box we've put it in. We'll deal with that in a moment.

Ah, but hang on, we've forgotten to turn the box outlines off. We need to do this because the outline gets in the way of what we want to do. Click the null pointer button and then press [Ctrl]-b (or use the Layout Tools requester) to get rid of them. OK, now click the Text tool and double click the 'D' again to select it.

BLITS & BOBS

The terms 'upper case' and 'lower case' come from the days when printers stored the individual metal letters in boxes – capitals above 'small letters'.

2 Press the down-arrow until there is no highlight left underneath the bottom-most part of the 'D'. In this particular case you need to do it 40 times; each press shifts the baseline down by half a point. (If you leave box outlines on there will always be one pixel-line of black underneath the letter – the outline of the bottom of the box.)

3 Select the null pointer and switch outlines back on. We're going to adjust the width now. Turn Snap To Grid off (press [Ctrl]-s) and drag the right edge of the box to the left (towards the letter) until it just touches the right-most part of the 'D'. When you let go of the mouse button the letter disappears.

There's a reason for this: remember that when we highlighted the letter there was a small portion of highlight that stuck out to the right of the 'D'? That's the width of the letter. (Don't blame me, it's the way the font has been designed.) So we need to come no closer to the right-most part of the 'D' than that. It was about four points I reckon, so double-click on the box and add 0.4 to the width measurement.

I'm following along with you here, and my box is now 4.4 picas wide and the 'D' is visible. If you select the 'D' now you should find that the highlight completely fills the box.

The gap between the the left edge of the box and the upright of the 'D' we needn't worry about; it doesn't present a problem because we'll bear that 'margin' (which looks like about four points) in mind when we position the drop capital on to the body text. We'll also bear in mind the four point 'margin' on the right when we set a standoff distance.

4 The standoff distance is how far away any text which flows around the box should be. It only works if the box is impermeable. To set these options we bring up the Active Box requester by double-clicking on the drop capital box (make sure you are in 'null pointer' mode first) and then click the Impermeable gadget (third from the left) so that the box with the X through it obscures the 'text' underneath. We enter the standoff distance in the top-right string gadget. As we've already got four points between the letter and the edge of the box, we'll enter 0.2 to make the total standoff 0.6 (six points). This standoff distance is all the way around the box – top, bottom, left and right.

Confirm the changes by clicking OK.

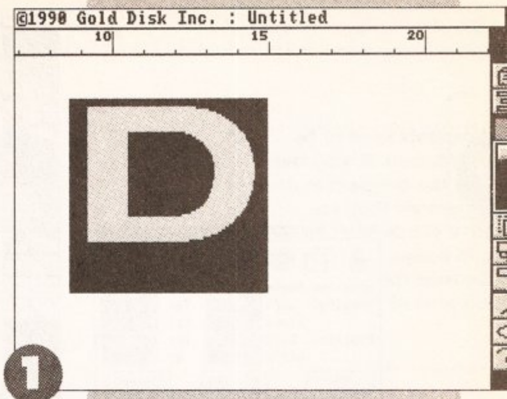
5 Now we need some body text. Anything will do for the purposes of this demonstration – provided that the paragraph starts with a letter 'D' of course, otherwise it'll look silly.

Create a box to the right of the drop capital 13 picas wide and 12 high (don't overlap the capital yet). Click on the Text tool, click in the text box and then change the typeface to Times 12pt and the style to Plain. The baseline is still shifted down by 20 points, so before you start to type in your text select Type/Baseline and reset it to zero.

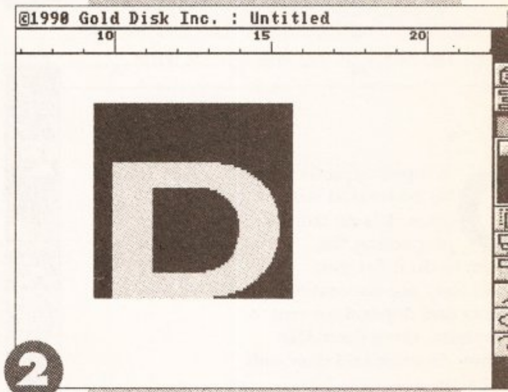
Now type in your text, omitting the 'D' of the first word. When you've finished, drag the text box over the capital so that the top left corners of both boxes are in the same position.

Aha! You were expecting the text to flow around the

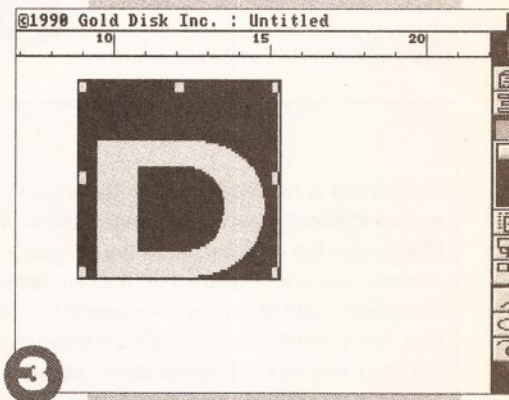
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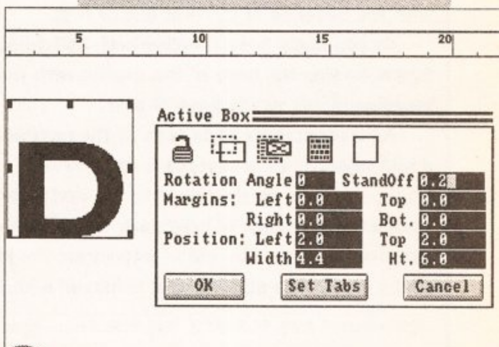
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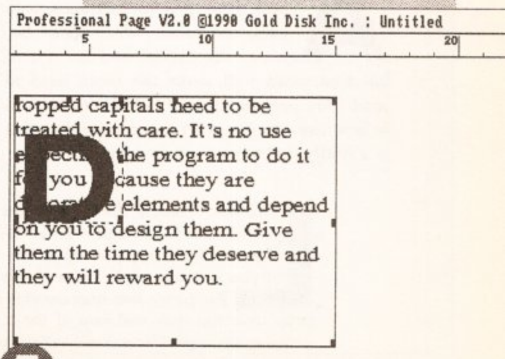
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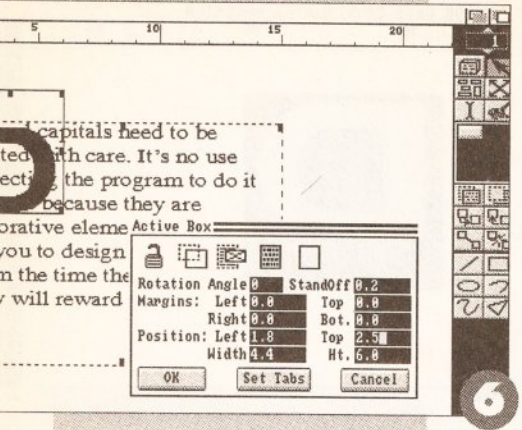
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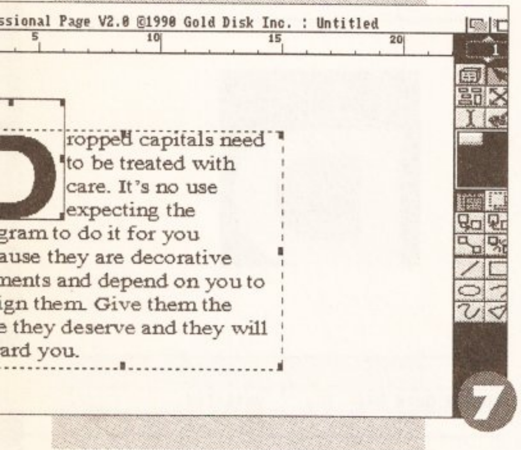
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5



6



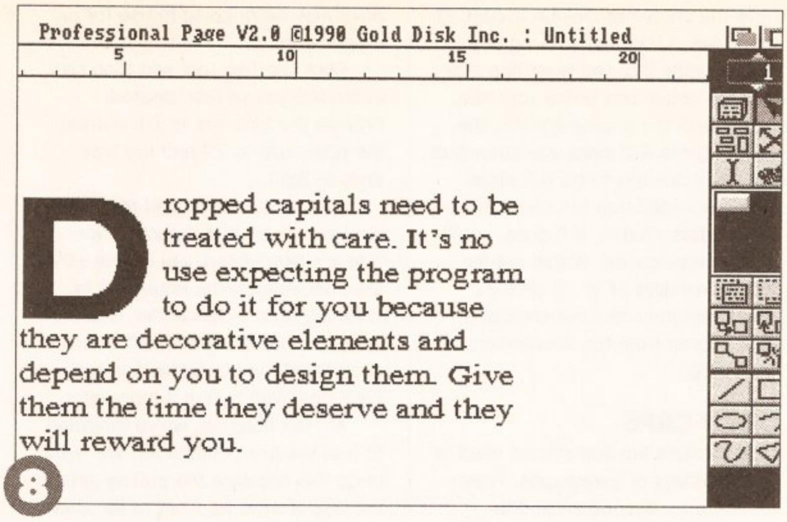
7

continued from page 79

capital, weren't you? (OK, yes, it was a reasonable assumption to make.)

The reason we have a mess on the screen is because the text is on top of the capital letter. To make the text flow around the capital (that is, the impermeable box), the drop cap box needs to be on top of the text.

6 But don't do that yet, because we're going to position the text box accurately first. Drag the box of text down a couple of picas and you'll see that it's almost level with the top of the 'D'. But what we actually want is for the top of the 'D' to be level with the top of the lower case letters in the text. So double-click the 'D' box and add five points (0.5 picas) to its Top position. While we're at it, we'll adjust the left position so that it is flush with the left edge of the box of text, so subtract four points from the value in the Position Left gadget as well.



8

7 Now that we've finally got everything in position, click once on the bit of the drop capital box that's poking up above the text box, and then click on the Bring to Front tool.

8 That's it, one drop capital. Turn the box outlines off ([Ctrl]-b) to have a clearer look. (Strictly speaking, the width of our body text box is too narrow for that point size, so it'll look better if you make it a bit wider – say, 15 picas.)

Right, that's it for another month. If there are any other DTP effects you're struggling to achieve, just drop me a line – or a rough sketch if you can't put it into words – and I'll try to include it in the next tutorial session that we do. Next month I'll be looking at the changes to PPage *2.1 and (if it's here in time)* Saxon Publisher 1.2. **AS**

OTHER DROP CAP STYLES

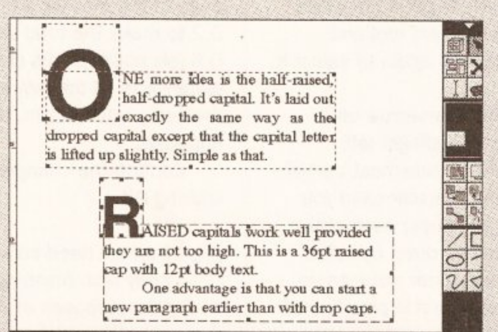
I mentioned in the main text that there are several different ways to treat drop capitals. And there's also the opposite, of course – raised capitals. These look a bit silly if they are more than about three times the point size of the box text. You'd implement a raised capital in exactly the same way as the dropped capital above, except that you'd line up the base of the capital with the baseline of the first line of text.

Or you could have it half-raised, half-dropped. Again, line up the base of the capital with the baseline of one of the lines of text.

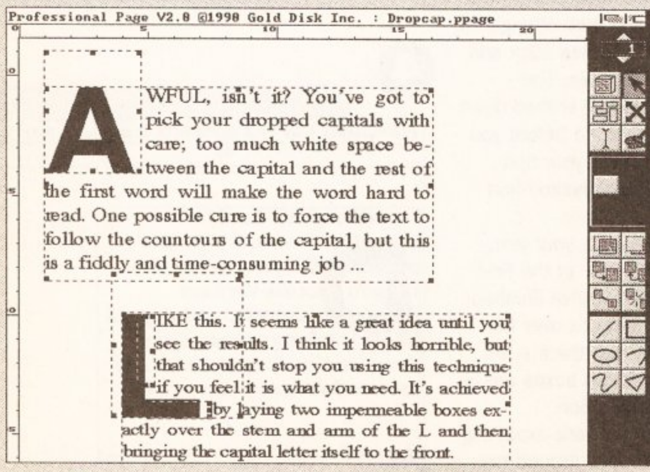
Another popular style is to fit the capital into a rectangular tint or reverse it out of a solid (make it a wob, as described in the text). This avoids the problems of irregularly-shaped letters, but often divorces the initial letter from the rest of the word. This style is best achieved with two boxes; an impermeable one for the tint or solid, another for the initial letter. Line up the top of the tint with the top of the text box (not the top of the lower case letters), and line up the bottom of the tint with the descenders of a line of text.

The top of the capital then lines up with the top of the lower case letters in the first line of text, and the base of the capital lines up with the baseline of the line of text that is just above the bottom of the tint. You can keep adjusting the point size of the capital until it's the height you want, but don't forget to give it a big enough box to fit in to.

One final tip when using drop capitals: make sure that the first word of the article is reasonably long. For instance, starting a piece with 'Mr Smith said' is fine normally, but putting the 'M' as a drop capital means that the 'r' is sitting there on its own at the beginning of the body text – something which not only looks ugly, but is also likely to confuse the reader.

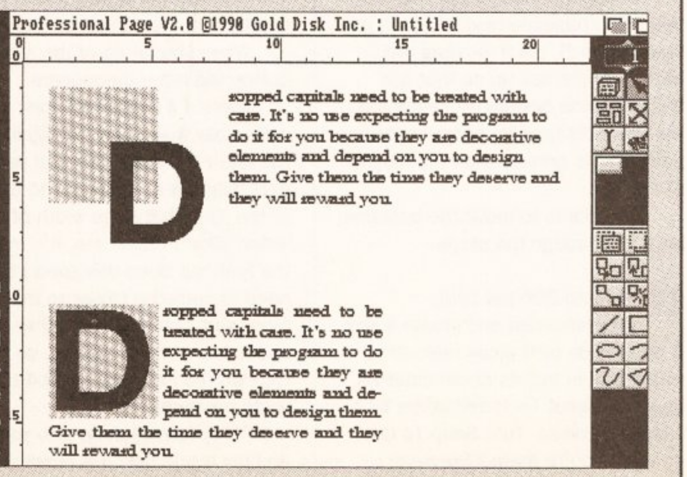


Sometimes raised or half-raised initial capitals look good – but be careful not to over-use the idea, or your publication will look amateurish.



Left: Make sure that you start your text with a letter which lends itself to being 'dropped'.

Right: Placing a drop capital on a tinted background looks nice, but can be distracting to the reader.



More gadget grappling

Dean Cracknell investigates more ways of making your GFA Basic programs interact with Intuition

Last month we took a first look at how to include Intuition gadgets in your GFA Basic programs, and gave an example showing how to implement a boolean gadget. This month we include other forms of gadgets.

RENDER GADGETS

Listing 1 is a modification of last month's listing, and replaces the border and IntuiText structures with an image structure of two arrows.

The image data must be in graphics (Chip) memory, so 'Malloc' is used to reserve some space for these images. It is important to de-allocate this memory using 'Mfree' when the program ends. The first gadget uses the left-arrow image and highlights this in the same way as last month. The second gadget uses the right-arrow as its main image and the left-arrow as its alternate image: the GADGHIMAGE flag tells Intuition to use this second image.

The data is linked to a structure that contains information concerning the position and size of the image. Following the pointer to the data are two flags concerned with the bitplanes that the image will occupy. The first, PlanePick, tells Intuition which plane to place the image on; the second, PlaneOnOff, tells it what to do with the remaining planes.

The data for these flags is: 1=Plane 0, 2=Plane 1, 4=Plane 2; they can be added together to deal with multiple planes. A standard Workbench (1.2 or 1.3) screen has two bitplanes (0 and 1), so in the example the data is placed on Plane 0 and the remaining plane is set to 0; on a standard colour Workbench this will result in a white arrow on the blue background. Don't worry if this sounds a bit confusing, we will come back to it in a later article.

STRING GADGETS

A string gadget provides a box for text to be typed in to.

Listing 2 (on page 84) gives an example of a string gadget that employs a string structure for the text entry. This is not like a Basic string, which is of variable length – a string structure is a fixed length and requires two buffers to be allocated.

On receiving the message that the gadget has been released (through the IDCMP message port), the text can then be copied out of the main buffer into a Basic string variable.

PROPORTIONAL GADGETS

Proportional gadgets are used to create slider controls, like those used in the right and bottom borders of a drawer window.

The proportional gadget created by Listing 3 (page 85) is a very simple horizontal one. The image structure that is declared in the program is for the slider knob, but as the program uses the AUTOKNOB feature the data for this structure is actually set up by Intuition.

The next structure to be set up is the PropInfo structure, which will determine what the gadget will look like and how it will behave. The PropInfo flags have been set for an AUTOKNOB which can move horizontally, and the start position has been set to zero – while the gadget is in operation these two locations will hold the actual x and y positions of the slider.

The effective width and height of the slider are set in the next two locations – the effective width of the slider (as opposed to the actual width) determines the number of steps that the slider will take from one end to the other. The slider track is 65,536 (&HFFFF) steps wide, so for the slider to take 64 steps to traverse the track the effective slider width will be 1,024 steps (65,536 ÷ 64 = 1,024). The remaining locations in the structure are used by Intuition and should be left alone.

Once again, the whole thing is held together by the Gadget structure, which has the PropGadget flag set as the Gadget type.

So far we have only seen a horizontal proportional gadget, but proportional gadgets can also be vertical, and mixed vertical and horizontal. Listing 4 shows the changes that are needed to the PropInfo structure in Listing 3 to convert it into a mixed horizontal and vertical slider. By comparing the two examples it should not take you too long to work out how to make a vertical-only gadget.

GADGETS IN BORDERS

Any gadget can be placed in any of the window's borders. Listing 3 can be modified, using the Gadget structure in Listing 5, so that the horizontal Prop-Gadget is moved down into the bottom border.

Normally it is not possible to draw within the window border, but by setting the window flags to give a GIMMEZEROZERO window this can be achieved. To create a border to put the gadget in to, the SIZEBOTTOM flag is also set. Because the gadget flags set the gadget to be relative to the window edges, the top position of the gadget and its overall width have to be negative numbers so that when the window is re-sized the position and width of the gadget will stay within the border. AS

LISTING 4 • LISTING 4 • LISTING 4

Modify the PropInfo structure at label_1 in Listing 3 to as below:

```
'
' Create PropInfo Structure
'
WORD{my1prop%+0}=1+2+4              ! +FREEVERT
WORD{my1prop%+2}=0                  ! HorizPot - Start Posn.
WORD{my1prop%+4}=0                  ! VertPot - Start Posn.
CARD{my1prop%+6}=&HFFFF/64          ! HorizBody, 64 Steps
CARD{my1prop%+8}=&HFFFF/64          ! VertBody,  64 Steps
WORD{my1prop%+10}=0                 ! CWidth
WORD{my1prop%+12}=0                 ! CHeight
WORD{my1prop%+14}=0                 ! HPotRes
WORD{my1prop%+16}=0                 ! VPotRes
WORD{my1prop%+18}=0                 ! LeftBorder
WORD{my1prop%+20}=0                 ! TopBorder
```

LISTING 5 • LISTING 5 • LISTING 5

Modify the gadget structure at label_2 in Listing 3 to look like this:

```
'
' Create Gadget Structure
'
LONG{my1gad%+0}=0                   ! Pointer to next gadget
WORD{my1gad%+4}=2                   ! LeftEdge
WORD{my1gad%+6}=-8                  ! TopEdge
WORD{my1gad%+8}=-20                 ! Width
WORD{my1gad%+10}=9                  ! Height
WORD{my1gad%+12}=0+&H8+&H20         ! +GRELBOTTOM|GRELWIDTH
WORD{my1gad%+14}=2+1+&H80           ! +BOTTOMBORDER
WORD{my1gad%+16}=3+&H2000           ! PROPGADGET|GZZGADGET
LONG{my1gad%+18}=my1image%          ! GadgetRender (Knob-Image)
LONG{my1gad%+22}=0                  ! SelectRender
LONG{my1gad%+26}=itext1%            ! The Text
LONG{my1gad%+30}=0                  ! MutualExclude
LONG{my1gad%+34}=my1prop%           ! Prop Info Structure
WORD{my1gad%+38}=1                  ! GadgetID (user defined)
LONG{my1gad%+40}=0                  ! Pointer to UserData
```

...then modify the OPENW #1 statement following label_3 with:

```
OPENW #1,0,20,319,70,idcmp%,&H42F ! Open a GimmeZeroZero Window
```

LISTING 1 • LISTING 1 • LISTING 1 • LISTING 1 • LISTING 1 • LISTING 1 • LISTING 1

```
'
' Simple Rendered Boolean Gadgets Example
'
' First Gadget
'
' gadgets image data
'
larrow%=MALLOC(18,&H10002) ! The Image (MUST be in Chip Memory)
rarrow%=MALLOC(18,&H10002) ! The Image (MUST be in Chip Memory)
INLINE my1image%,20
INLINE my1gad%,44
INLINE my2image%,20
INLINE my2gad%,44
WORD{larrow%+0}=&H0                 ! Left Arrow
WORD{larrow%+2}=&H300
WORD{larrow%+4}=&HF00
WORD{larrow%+6}=&H3FFC
WORD{larrow%+8}=&HFFFC
WORD{larrow%+10}=&H3FFC
WORD{larrow%+12}=&HF00
WORD{larrow%+14}=&H300
WORD{larrow%+16}=&H0
'
WORD{rarrow%+0}=&H0                 ! Right Arrow
WORD{rarrow%+2}=&HC0
WORD{rarrow%+4}=&HF0
WORD{rarrow%+6}=&H3FFC
WORD{rarrow%+8}=&H3FFF
WORD{rarrow%+10}=&H3FFC
WORD{rarrow%+12}=&HF0
WORD{rarrow%+14}=&HC0
WORD{rarrow%+16}=&H0
'
' gadget image structure
'
WORD{my1image%+0}=0                 ! Left Edge
WORD{my1image%+2}=0                 ! Top Edge
WORD{my1image%+4}=16                ! Width
WORD{my1image%+6}=9                 ! Height
WORD{my1image%+8}=1                 ! Depth
LONG{my1image%+10}=larrow%          ! Image data
BYTE{my1image%+14}=1                ! PlanePick
BYTE{my1image%+15}=0                ! PlaneOnOff
LONG{my1image%+16}=0                ! Pointer to Next Image
'
' Create Gadget Structure
'
LONG{my1gad%+0}=0                   ! Pointer to next gadget
WORD{my1gad%+4}=40                  ! LeftEdge
WORD{my1gad%+6}=20                  ! TopEdge
WORD{my1gad%+8}=16                  ! Width
WORD{my1gad%+10}=9                  ! Height
WORD{my1gad%+12}=0+4                ! GADGEHCOMP
WORD{my1gad%+14}=2+1                ! GADHIMMEDIATE | RELVERIFY
WORD{my1gad%+16}=1                  ! BOOLGADGET
LONG{my1gad%+18}=my1image%          ! GadgetRender
LONG{my1gad%+22}=0                  ! SelectRender
LONG{my1gad%+26}=0                  ! The Text
LONG{my1gad%+30}=0                  ! MutualExclude
LONG{my1gad%+34}=0                  ! Special Info (NONE)
WORD{my1gad%+38}=1                  ! GadgetID (user defined)
LONG{my1gad%+40}=0                  ! Pointer to UserData
'
' Second Gadget
' This will be similar to 1st,but with different image,position
' and activation mode (it will Toggle ON/OFF with each press)
' so we can simply copy the first and alter it to suit. It will
' be the same size as the first,so can use same Border Structure.
'
BMOVE my1image%,my2image%,20        ! The 2nd Image Structure
LONG{my2image%+10}=rarrow%          ! The Right Arrow Image data
'
BMOVE my1gad%,my2gad%,44            ! The new Gadget Structure
WORD{my2gad%+4}=140                 ! Add the new Left Edge
WORD{my2gad%+12}=4+2                ! GADGIMAGE | GADGHIMAGE
LONG{my2gad%+18}=my2image%          ! The new Image Structure
                                      (rarrow)
LONG{my2gad%+22}=my1image%          ! The Select Image Structure
                                      (larrow)
LONG{my2gad%+38}=2                  ! change the GadgetID
'
' now all we have to do is link the two together...
'
LONG{my1gad%+0}=my2gad%
'
' Open a couple of Windows to display the Gadgets and ↵
various messages...
'
idcmp%=&H260                        ! tell me if WindowClose ↵
                                      or Gadget is UP/DOWN
OPENW #1,0,20,319,70,idcmp%,&HF
TITLEW #1,"Window #1 - with 2 Gadgets"
LOCATE 2,5
PRINT "Two Rendered Boolean Gadgets"
PRINT
PRINT "   (Close This Window to quit)"
idcmp%=&H0                          ! don't tell me anything ↵
                                      from this window
OPENW #2,321,20,319,100,idcmp%,&HF
TITLEW #2,"Window #2 - IDCMP Data "
'
' Add the two new Gadgets to Window 1
'
fred=AddGList(WINDOW(1),my1gad%,-1,2,0)
~RefreshGadgets(my1gad%,WINDOW(1),0)
'
PRINT "Gadget ";fred;": ";HEX$(my1gad%,6);"    ";
PRINT "Gadget ";fred+1;": ";HEX$(my2gad%,6)
PRINT "Window 1: ";HEX$(WINDOW(1),6);"    ";
PRINT "Window 2: ";HEX$(WINDOW(2),6);" ";
'
ON MESSAGE GOSUB what_message
'
wclose!=FALSE
REPEAT
  SLEEP
UNTIL wclose!
'
' Clean-up Memory - BASIC does not automatically ↵
de-allocate on exiting
'
fred=RemoveGList(WINDOW(1),my1gad%,2)
IF larrow%<>0 THEN
a=MFREE(larrow%,18)                 ! Give back some Chip memory
ENDIF
IF rarrow%<>0 THEN
a=MFREE(rarrow%,18)
ENDIF
CLOSEW #1
CLOSEW #2
END
'
PROCEDURE what_message
'
LOCAL wad%,wnr%,msg%,gadno&
'
wad%=MENU(9)                        ! Window Address
wnr%=WINDOW(wad%)                   ! Window Number
msg%=MENU(1)                        ! IDCMP-Flags
LOCATE 1,4
gadptr%=MENU(4)+38
IF EVEN(gadptr%) THEN
gadno&=WORD{gadptr%}                ! Read which Gadget
ELSE
gadno&=-1
ENDIF
PRINT
PRINT "Window: ";wnr%;" "
PRINT "ICDMP Message :";HEX$(msg%,4);" "
SELECT msg%
CASE &H20
PRINT "GADGET ";gadno&;" DOWN    "
CASE &H40
PRINT "GADGET ";gadno&;" UP      "
CASE &H200
PRINT "WINDOW CLOSED"
DELAY 0.5
wclose!=TRUE
ENDSELECT
RETURN
```

continued on page 84

continued from page 83

LISTING 2 • LISTING 2 • LISTING 2 • LISTING 2 • LISTING 2 • LISTING 2 • LISTING 2

```
' String Gadget Example
'
' Reserve some memory
INLINE my1brdr%,16
INLINE imsg1%,16
INLINE itext1%,20
INLINE mybuffer%,40
INLINE myundobuffer%,40
INLINE my1strinfo%,36
INLINE my1gad%,44
DIM my1points&(10) ! The Boxes
'
' First Gadget
'
' gadget border box-drawing co-ordinates
my1points&(0)=-5
my1points&(1)=-2
my1points&(2)=170
my1points&(3)=-2
my1points&(4)=170
my1points&(5)=9
my1points&(6)=-5
my1points&(7)=9
my1points&(8)=-5
my1points&(9)=-2
'
' gadget border structure
WORD{my1brdr%+0}=0                 ! Left Edge
WORD{my1brdr%+2}=0                 ! Top Edge
BYTE{my1brdr%+4}=1                 ! Front Pen
BYTE{my1brdr%+5}=0                 ! Back Pen
BYTE{my1brdr%+6}=0                 ! Draw Mode (JAM1)
BYTE{my1brdr%+7}=5                 ! Byte Count
LONG{my1brdr%+8}=V:my1points&(0)   ! 5 co-ord array
LONG{my1brdr%+12}=0                ! Pointer to Next Border
'
' Create the Intuitext Structure
@strcpy(imsg1%,"Enter")            ! The Gadgets Text
'
BYTE{itext1%+0}=1                  ! Foreground Pen
BYTE{itext1%+1}=0                  ! Background Pen
BYTE{itext1%+2}=0                  ! JAM1
BYTE{itext1%+3}=&HA                ! dunno
WORD{itext1%+4}=-61                ! Left Edge
WORD{itext1%+6}=0                  ! Top Edge
LONG{itext1%+8}=0                  ! ITextFont (NULL)
LONG{itext1%+12}=imsg1%            ! The Text to be Displayed
LONG{itext1%+16}=0                 ! NextText (NULL)
'
' Create a StringInfo Structure
LONG{my1strinfo%+0}=mybuffer%      ! a Pointer to the input buffer
LONG{my1strinfo%+4}=myundobuffer%  ! ... and the undo-buffer
WORD{my1strinfo%+8}=0              ! BufferPos (CURSOR)
WORD{my1strinfo%+10}=40            ! MaxChars
WORD{my1strinfo%+12}=0             ! DispPos
WORD{my1strinfo%+14}=0             ! UndoPos
WORD{my1strinfo%+16}=0             ! NumChars
WORD{my1strinfo%+18}=0             ! DispCount
WORD{my1strinfo%+20}=0             ! CLeft
WORD{my1strinfo%+22}=0             ! Ctop
LONG{my1strinfo%+24}=0             ! LayerPtr
LONG{my1strinfo%+28}=0             ! LongInt
LONG{my1strinfo%+32}=0             ! AltKeyMap
'
' Create Gadget Structure
LONG{my1gad%+0}=0                  ! Pointer to next gadget
WORD{my1gad%+4}=68                 ! LeftEdge
WORD{my1gad%+6}=20                 ! TopEdge
WORD{my1gad%+8}=168                ! Width
WORD{my1gad%+10}=8                 ! Height
WORD{my1gad%+12}=0                 ! GADGEHCOMP
WORD{my1gad%+14}=2+1               ! GADHIMMEDIATE | RELVERIFY
WORD{my1gad%+16}=4                 ! STRGGADGET
LONG{my1gad%+18}=my1brdr%          ! GadgetRender
LONG{my1gad%+22}=0                 ! SelectRender
LONG{my1gad%+26}=itext1%           ! The Text
LONG{my1gad%+30}=0                 ! MutualExclude
LONG{my1gad%+34}=my1strinfo%       ! Special Info (NONE)
WORD{my1gad%+38}=1                 ! GadgetID (user defined)
LONG{my1gad%+40}=0                 ! Pointer to UserData
```

```
' Open a couple of Windows to display the Gadget and ↵
various messages...
idcmp%=&H260                       ! tell me if WindowClose ↵
                                   or Gadget is UP/DOWN
OPENW #1,0,20,319,70,idcmp%,&HF
TITLEW #1,"Window #1 - with 2 Gadgets"
LOCATE 8,5
PRINT "A String Gadget"
PRINT
PRINT "  (Close this Window to quit)"
idcmp%=&H0                         ! don't tell me anything ↵
                                   from this window
OPENW #2,321,20,319,100,idcmp%,&HF
TITLEW #2,"Window #2 - IDCMP Data "
'
' Add the new Gadget to Window 1
'
fred=AddGList(WINDOW(1),my1gad%,-1,1,0)
~RefreshGadgets(my1gad%,WINDOW(1),0)
'
PRINT "Gadget ";fred;": ";HEX$(my1gad%,6);"    "
PRINT "Window 1: ";HEX$(WINDOW(1),6);"    ";
PRINT "Window 2: ";HEX$(WINDOW(2),6);" ";
'
ON MESSAGE GOSUB what_message
'
wclose!=FALSE
REPEAT
SLEEP
UNTIL wclose!
'
' Clean-up Memory - BASIC does not automatically ↵
de-allocate on exiting
'
fred=RemoveGList(WINDOW(1),my1gad%,1)
CLOSEW #1
CLOSEW #2
END
'
PROCEDURE what_message
LOCAL wad%,wnr%,msg%,gadno&
'
wad%=MENU(9)                       ! Window Address
wnr%=WINDOW(wad%)                  ! Window Number
msg%=MENU(1)                       ! IDCMP-Flags
LOCATE 1,4
gadptr%=MENU(4)+38
IF EVEN(gadptr%) THEN
gadno&=WORD{gadptr%}               ! Read which Gadget
ELSE
gadno&=-1
ENDIF
PRINT
PRINT "Window: ";wnr%;" "
PRINT "ICDMP Message :";HEX$(msg%,4);" "
SELECT msg%
CASE &H20
PRINT "GADGET ";gadno&;" DOWN    "
CASE &H40
PRINT "GADGET ";gadno&;" UP      "
IF gadno&=1 THEN
mybuffer$=CHAR{mybuffer%}          ! Read the Text the polite way
PRINT "Text:";LEN(mybuffer$);" ";mybuffer$
ENDIF
CASE &H200
PRINT "WINDOW CLOSE"
DELAY 0.5
wclose!=TRUE
ENDSELECT
RETURN
PROCEDURE strcpy(dst%,src$)
  '
  ' this procedure performs the same function as
  ' CHAR{dst%}=src$, which works fine in the interpreter
  ' but doesn't compile properly (for some reason...)
  src$=src$+CHR$(0)
  adr%=V:src$
  leng=LEN(src$)
  BMOVE adr%,dst%,leng
RETURN
```

LISTING 3 • LISTING 3 • LISTING 3 • LISTING 3 • LISTING 3 • LISTING 3 • LISTING 3

```
' Proportional Gadget Example
'    - Horizontal - AutoKnob
'
' Reserve some memory
'
INLINE imsg1%,16
INLINE itext1%,20
INLINE my1image%,20
INLINE my1prop%,22
INLINE my1gad%,44
'
' First Gadget
'
' The message...
@strcpy(imsg1%,"Level:")               ! The First Gadgets Text
'
' Create the Intuitext Structure
'
BYTE{itext1%+0}=1                      ! Foreground Pen
BYTE{itext1%+1}=0                      ! Background Pen
BYTE{itext1%+2}=0                      ! JAM1
BYTE{itext1%+3}=&HA                    ! dunno
WORD{itext1%+4}=-53                    ! Left Edge
WORD{itext1%+6}=2                      ! Top Edge
LONG{itext1%+8}=0                      ! ITextFont (NULL)
LONG{itext1%+12}=imsg1%                ! The Text to be Displayed
LONG{itext1%+16}=0                     ! NextText (NULL)
'
' Create an Image Structure for the Proportional Gadgets' Knob
' ...but we do not need to initialise it as Intuition takes
care of that
'
WORD{my1image%+0}=0                    ! Left Edge
WORD{my1image%+2}=0                    ! Top Edge
WORD{my1image%+4}=0                    ! Width
WORD{my1image%+6}=0                    ! Height
WORD{my1image%+8}=0                    ! Depth
LONG{my1image%+10}=0                   ! Image data
BYTE{my1image%+14}=0                   ! PlanePick
BYTE{my1image%+15}=0                   ! PlaneOnOff
LONG{my1image%+16}=0                   ! Pointer to Next Image
'
label_1:
'
' Create PropInfo Structure
'
WORD{my1prop%+0}=1+2                   ! FREEHORIZ | AUTOKNOB
WORD{my1prop%+2}=0                     ! HorizPot - Start Posn.
WORD{my1prop%+4}=0                     ! VertPot - Start Posn.
CARD{my1prop%+6}=&HFFFF/64             ! HorizBody, 64 Steps
CARD{my1prop%+8}=0                     ! VertBody,  0 Steps
WORD{my1prop%+10}=0                    ! CWidth
WORD{my1prop%+12}=0                    ! CHeight
WORD{my1prop%+14}=0                    ! HPotRes
WORD{my1prop%+16}=0                    ! VPotRes
WORD{my1prop%+18}=0                    ! LeftBorder
WORD{my1prop%+20}=0                    ! TopBorder
'
label_2:
'
' Create Gadget Structure
'
LONG{my1gad%+0}=0                      ! Pointer to next gadget
WORD{my1gad%+4}=68                     ! LeftEdge
WORD{my1gad%+6}=12                     ! TopEdge
WORD{my1gad%+8}=200                    ! Width
WORD{my1gad%+10}=22                    ! Height
WORD{my1gad%+12}=0                     ! GADGEHCOMP
WORD{my1gad%+14}=2+1                   ! GADHIMMEDIATE | RELVERIFY
WORD{my1gad%+16}=3                     ! PROPGADGET
LONG{my1gad%+18}=my1image%             ! GadgetRender (Knob-Image)
LONG{my1gad%+22}=0                     ! SelectRender
LONG{my1gad%+26}=itext1%               ! The Text
LONG{my1gad%+30}=0                     ! MutualExclude
LONG{my1gad%+34}=my1prop%              ! Prop Info Structure
WORD{my1gad%+38}=1                     ! GadgetID (user defined)
LONG{my1gad%+40}=0                     ! Pointer to UserData
'
' Open a couple of Windows to display the Gadget and various
' messages...
idcmp%=&H260       ! tell me if WindowClose or Gadget is UP/DOWN
'
label_3:
'
OPENW #1,0,20,319,70,idcmp%,&HF
TITLEW #1,"Window #1 - with 1 Gadget"
LOCATE 8,5
PRINT "A Proportional Gadget"
PRINT
PRINT "  (Close this Window to quit)"
idcmp%=&H0           ! don't tell me anything from this window
OPENW #2,321,20,319,100,idcmp%,&HF
TITLEW #2,"Window #2 - IDCMP Data "
'
' Add the new Gadget to Window 1
'
fred=AddGList(WINDOW(1),my1gad%,-1,1,0)
~RefreshGadgets(my1gad%,WINDOW(1),0)
'
PRINT "Gadget ";fred;": ";HEX$(my1gad%,6);"     "
PRINT "Window 1: ";HEX$(WINDOW(1),6);"         ";
PRINT "Window 2: ";HEX$(WINDOW(2),6);" ";
'
ON MESSAGE GOSUB what_message
'
wclose!=FALSE
REPEAT
SLEEP
UNTIL wclose!
'
' Clean-up Memor
'
fred=RemoveGList(WINDOW(1),my1gad%,1)
CLOSEW #1
CLOSEW #2
END
'
PROCEDURE what_message
LOCAL wad%,wnr%,msg%,gadno&
'
wad%=MENU(9)                                      ! Window Address
wnr%=WINDOW(wad%)                                 ! Window Number
msg%=MENU(1)                                      ! IDCMP-Flags
LOCATE 1,4
gadptr%=MENU(4)+38
IF EVEN(gadptr%) THEN
gadno&=WORD{gadptr%}                              ! Read which Gadget
ELSE
gadno&=-1
ENDIF
PRINT
PRINT "Window: ";wnr%;" "
PRINT "ICDMP Message :";HEX$(msg%,4);" "
SELECT msg%
CASE &H20
PRINT "GADGET ";gadno&;" DOWN    "
CASE &H40
PRINT "GADGET ";gadno&;" UP      "
CASE &H200
PRINT "WINDOW CLOSE"
DELAY 0.5
wclose!=TRUE
ENDSELECT
IF gadno&=1 THEN
xvalue&=CARD{my1prop%+2}/&HFFFF*64   ! Get Horiz-Pot Value
yvalue&=CARD{my1prop%+4}/&HFFFF*64   ! Get Vert-Pot Value
PRINT "Position: ";xvalue&;",";yvalue&;" ";
ENDIF
RETURN
PROCEDURE strcpy(dst%,src$)
'
' this procedure performs the same function as
' CHAR{dst%}=src$, which works fine in the interpreter
' but doesn't compile properly (for some reason...)
'
src$=src$+CHR$(0)
adr%=V:src$
  leng=LEN(src$)
  BMOVE adr%,dst%,leng
RETURN
```

AMOS action

This month Phil South re-opens the AMOS AMAL tutorial, and also tinkers around with his copper

AMOS 3D and the AMOS Compiler are making AMOS of interest to many people who would previously have put the language down as just a games creator. AMOS is much more than than that, but it is true to say that some of the best programs ever written are games – because they are excellent examples of skillful programming. Which is why I always encourage you to examine every AMOS program you can find, to see how it's done. Obviously, the more people compile their programs the less easy this will be, so I would ask all AMOS programmers to leave their source code on the disks when they distribute their programs. How much of a threat can it be just to pass on some of the knowledge that you have to people coming along at the rear? It's your ideas they can't copy, not your code!

COPPER LISTS

On many demos you will see effects called 'plasma' or 'copper list' effects; these are excellent detailed rainbow patterns where every horizontal line has a slightly different colour from those above and below – which produces very subtle shading.

It's possible to do plasma and copper effects from AMOS using the copper specific SCREEN-type commands. All you need to do is use the 'Set Rainbow' and 'Rainbow' commands to configure the coloured bars and position them on screen. This program is an example of what you can do:

```
Cls 0 : Hide
Set Rainbow 0,0,50,"","",""
Rainbow 0,0,0,256
Restore RD
For V=0 To 49 : Read DIT :   ↵
Rain(0,V)=DIT
Next V : View
Wait 1000
'
RD:
Data $D80,$C70,$B60,$A50
Data $900,$800,$700,$600,    ↵
$500,$400,$300,$200
Data $800,$700,$600,$500,    ↵
$400,$300,$200,$100
Data $FF0,$EE0,$DD0,$CC0,    ↵
$BB0,$AA0,$990
Data $880,$770,$660,$550,    ↵
$440,$330,$220,$110
Data $F0F,$E0E,$D0D,$C0C,$B0B
Data $A0A,$909,$808,$707,    ↵
$606,$505,$404,$303
Data $202,$101
```

The 'Set Rainbow' command sets up the initial conditions for the copper list. The first figure is the Rainbow number – the number of this particular list of colours; this can be in the range 0-3. The second figure is the colour index, this being a colour in the range 0-15. The third figure is the size of the colour table, and this can be any size from 16 up to 65,500. If this figure is shorter than the length of your rainbow on the screen then the pattern will be repeated, as in this example. You can feed the RGB colours of your rainbow colours into the last three spaces at the end of the command, but in this example we're feeding in the colours from a table of data, called RD.

Having set up the rainbow, the 'Rainbow' command displays it. The first number is the number of the rainbow you set earlier, in this case Rainbow 0. The second number is the base figure which, if you alter it, will cycle the rainbow. The last two figures are the start point of the rainbow pattern – in this case the top of the screen, 0 – and the number of lines the rainbow covers (the height), which in the example is 256 lines.

After that, we have a little loop which feeds the data from RD into a Rain(x,y) command, where x is the Rainbow number and y is the individual scan line to be changed.

continued on page 88



"Welcome to the AMOS column, where every month you can find tutorials, hints and tips for the AMOS Basic interpreter."
Phil South

USING AMAL PART 2

In the next few months I'll be covering the AMOS Animation Language (AMAL) routines for AMOS in more detail, showing you ways to improve you AMOS programs.

AMAL is a sort of subset of AMOS which allows you to do very fast animations and run them with very little slowing up of the program. So you can have a number of animations going on – a number of AMAL programs multitasking together, in effect – at the same time. AMAL is simple to use, and the command set is restricted to a handful of commands which I detailed in issue 6. The speed of the commands is achieved by compiling them before they are run, allowing for faster execution than is normally possible through Basic – even AMOS Basic. Using AMAL you can animate everything from a single sprite to an entire screen. Up to 64 AMAL programs can be run simultaneously, although you can only run up to 16 without interfering with the flow of the regular AMOS commands.

Last time I talked about how you use the AMAL commands, in very simple terms. This time, by way of an introduction to advanced AMAL techniques, I want to draw your attention to the AMAL Editor you got free with your AMOS Extras disk. AMAL Editor is an AMOS program, so you need to run it from AMOS or RAMOS, or compile it and run it from the Workbench. Even better, you can install it as an AMOS Accessory to be available from AMOS at any time.

AMAL Editor

Although for simple AMAL programs the usual approach of creating them in string variables and adding them together to make one big program is the best approach (see the AMAL tutorial part 1 in issue 6 of *Amiga Shopper*), for larger effects the AMAL Editor is the best way. This allows you to construct a perfect AMAL program and compact it into a regular AMOS memory bank, then load and save it as an .abk file. As well as allowing you to enter and edit the AMAL programs just like a normal AMOS program, the Editor allows you to save the memory bank files so you can use the same sequences in many programs.

Once you've run the AMAL Editor, you are faced with the main screen. From this screen you can write your AMAL programs or test them. A menu selection takes you to the AMAL Monitor, where you can examine the progress of any of the AMAL channels you have running. Another menu selection allows you to set up movements like the PLAY command in regular AMAL, only this is all automatic and you can save your mouse moves to a memory bank.

Once an AMAL program has been written using the editor it can be saved to a memory bank and loaded into an AMOS program. Then the AMOS channels can be called as if you'd done them the conventional way.

Next month we'll be going deeper into the wonderful world of AMAL – stay tuned!



The main screen of the AMAL Editor, from where you can save programs as AMAL banks.

continued from page 87

The colours of the lines are stored in the data statements after the RD label. And there you have it, instant rainbows.

This is a lead-in to a few really neat copper tricks I picked up recently, which I'll go into next month. So keep this issue handy when you read the next installment of AMOS Action.

Incidentally, there is a utility available which enables you to design your own copper lists and save them out as AMOS code or even as source for an assembler. The program is called *Rainbow Warrior*, it's been written in AMOS by Martyn Brown, and is available through the AMOS PD Library. I actually reviewed this a in issue 2, so dig out your old copies of *Amiga Shopper* and look it up.

DEMO CORNER

This is the part of the column where I take a quick census of what really good programs there are out there written in AMOS.

ElectroCAD (NBS) is an electronics schematic drawing and printed circuit board design tool written in compiled AMOS. A combination of symbols based in libraries are used to build up schematic and PCB artworks, and these can then be saved to disk and printouts obtained. Since *ElectroCAD* v1.3 first went on sale the program has become very successful, and now electronically-minded people are using it all over Britain.

AMOS Art (Deja Vu) is a collection of very handy picture files containing fonts and other graphically oriented clips for you to use in your own AMOS programs. Deja Vu is, of course, the licenseware label side of the AMOS PD Library. These are not PD programs, hence the new label. Send off to the AMOS PD Library for lists of the latest releases.

Finally, *Sprite Bank Editor* (Deja Vu) is a set of useful tools from the Blitter Boys. This compiled program allows you to load and save .abk sprite bank files. In fact, there are some on the disk for you to be going along with, to test how the program works, and these are very good starting points for a lot of types of games programming.

See you next month! AS

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AMOS can be obtained from your local Amiga stockist or from:

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AMOS HINTS AND TIPS

If you have any hints and tips that you want to send me, stick them on paper or a disk and send them to: Phil South, AMOS Column, Amiga Shopper, 30 Monmouth Street, Bath BA1 2BW. Or you can e-mail me on cix as 'snouty@cix.compulink.co.uk'.

● How about this neat routine for getting vertically scrolling centered text? The text in the DATA statements is centered and scrolled up the screen, and it's also faded in and out at the top and bottom by a Rainbow. It makes scrolling text very professional.

```
' ***********************
' *** VERTSCROLL v2.0 ***
' ***********************
'
Rainbow Del : Auto View Off : Hide
Restore TEKST : Read N : Dim TE$(N)
For X=1 To N : Read TE$(X) : Next
'
Screen Open 0,640,N*8+256,2,Hires :   ↲
Curs Off : Cls 0
Colour 0,$0 : Colour 1,$0
SPEED=0
'
For I=1 To N : Centre TE$(I) :        ↲
Print : Next
Set Rainbow
0,1,3000,"(16,1,16)","(16,1,16)","    ↲
(16,1,16)"
EFX
Rainbow 0,,0,256
Screen Display 0,128,300,320,255
Auto View On
'
Repeat
Screen Display 0,,280,,
Screen Offset 0,0,0
For Y=280 To 40 Step -1
If SPEED>0 Then Wait SPEED
Wait Vbl
Screen Display 0,128,Y,320,258
Next
For Y=0 To N*8
If SPEED>0 Then Wait SPEED
Screen Offset 0,0,Y
Wait Vbl
Next
Wait 100
Until Inkey$<>""
End
TEKST:
Data 64-36
Data "--ooOOOoo---"
Data ""
Data "Hi There!"
Data ""
Data "Welcome to the Vertscroller"
Data ""
Data "Specially made from hot buns"
Data ""
Data "for a cool winter's night."
Data ""
Data "AMOS allows you to do many such ↲
things..."
Data ""
Data "...and very simply too!"
Data ""
Data "And using only simple Basic      ↲
code instructions."
Data ""
Data "--oO*Oo--"
Data ""
Data "Original code design by KV"
Data "91 Design by Snouter"
Data "Produced by Amiga Shopper"
Data ""
Data "That's all we have time for now.↲
See you later..."
Data ""
Data "Be there, be square, keep a comb↲
in your hair!"
Data ""
Data "--oOo--"
Data "-o-"
Procedure EFX
C=0
For L=0 To 127 Step 8
For X=0 To 7
Rain(0,L+X)=C
Next
C=C+$111
Next
C=$FFF
For L=128 To 255 Step 8
For X=0 To 20
Rain(0,L+X)=C
Next
C=C-$111
Next
End Proc
```

● AMOS has the uncanny ability to store items of code like sounds, screens and music as part of the AMOS program itself. Rather than loading in IFF sounds or pictures, you can load and save them as special format .abk files; this is an especially good method for using IFF screens in your own programs. But the screens have to be packed with the SPACK command, and this means writing your own program to do this. Yes, packing and unpacking screens can be such a bore. So here's a utility to do just that.

```
' ***************************
' *** SPACK THOSE SCREENS ***
' ***************************
'
Screen Open 0,320,16,2,Lowres
Curs Off
Flash Off
Colour 1,$FF
Screen Display 0,,40,,8
'
TEN:
Screen Open 1,320,200,2,Lowres :       ↲
Screen Hide 1
'
TWENTY:
F$=Fsel$("","","Load IFF Picture To    ↲
SPACK"): If F$="" Then Goto TWENTY
If Exist(F$) Then Screen 0 : Centre    ↲
"Loading IFF Picture" : Print : Load   ↲
Iff F$,1 : Else Goto TWENTY
Screen 0 : Centre "Spacking Current    ↲
Picture..." : Print : Spack 1 To 6 :   ↲
Screen Close 1
'
THIRTY:
F$=Fsel$("","","Save Spacked Bank") :  ↲
If F$="" Then Goto THIRTY
Screen 0 : Centre "Saving Spack bank   ↲
to disk" : Print : Save F$,6 : Erase   ↲
6 : Centre "Press Key To Continue..." :
Print : Wait Key : Goto TEN
```

Now all you have to do is load the .abk bank in direct mode, and the screen will be in a memory bank in the AMOS program ready for you to unpack to the screen of your choice.

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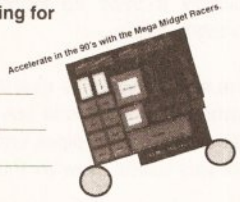
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Cracking the Shell



"Pipes are a misunderstood and under-used feature of AmigaDOS – but they can solve some interesting problems; let's see."
Mark Smiddy

Mark Smiddy continues the feature on a simple multi-user system and explains how to use the pipes to implement a simple real-time chat system.

Implementing and experimenting with a dual-user system is fun. If you are still struggling trying to get your setup to work, you may find the debugging chart on Page 92 useful. Last month I described some file-based messaging programs and in this part, I want to take that a step further. You may recall those programs waited for a specific time and checked for any pending messages. However, it would be much nicer if messages could be instantly displayed – like the chat system found in better BBSs; CIX for instance. Although this is possible using pipes, there are a few minor limitations which are due to AmigaDOS's scripting language.

USING PIPES

Before going into the complexities of pipes and piping in general, the simplest way to consider a pipe is to think of it as a file on the RAM disk. A pipe file can be created and read in exactly the same way as a RAM file. Try this:

```
1>COPY S:SPAT to RAM:
1>TYPE RAM:
```

AmigaDOS responds by copying the SPAT script into RAM and then displaying it in the current Shell window. Now try it using a pipe:

```
1>COPY S:SPAT to PIPE:
1>TYPE PIPE:
```

The result should be exactly the same. Although this is one way to show how simple pipes can be, it is not very useful. Now try this:

```
1>DIR PIPE:
```

AmigaDOS responds with an error. Why? Consider this example (with accompanying error) for a clue.

```
1>MAKEDIR PIPE:testing
Cannot create directory
Packet request type unknown
```

As you can see, directories are not supported by pipes. The error message (it varies with different AmigaDOS versions) has come from the pipe device – it does not understand what has been asked of it. The device does not support requests to create directories on it – much the same effect can be gained by attempting to create a directory on another non-disk device such as the serial sub-system:

```
1>MAKEDIR SER:testing
Cannot create directory
Packet request type unknown
```

Common sense dictates this is ridiculous – even though it seems almost logical, after all it works on many other devices RAM:, RAD:, DFx:, DHx: to name but a few. I'll cover more on the intricacies of AmigaDOS devices in a future feature, this article will concentrate on pipes. Now try this:

```
1>COPY S:SPAT to RAM:
1>MAKEDIR RAM:SPAT/testing
Cannot create directory
RAM:SPAT/testing
```

This error "Cannot create directory" occurs because you are effectively trying to create a sub-directory of a file. Files are stored in directories –

continued on page 92

BEGINNERS • BEGINNERS **BEGINNERS START HERE** **BEGINNERS • BEGINNERS**

What are pipes?

Pipes (FIFO buffers) seem like confusing concepts when applied to computers but most of us use them in our everyday lives. When you stand in line at a bus stop, you are in a pipe buffer. The first passenger in the line is the first to board the bus: first in the queue, first out of it. When the bus is full, the person at the front of the queue has to wait until the next bus comes along – but will still be first on when it does.

Pipes work in exactly the same way. Think of each passenger as an item of data waiting to be processed. When the device is ready to receive data (a bus arrives) data packets (passengers) leave the queue. If the device becomes full, the flow of data stops until the device signals it's ready to receive more data. Also, just as most people will refuse to join a very long queue, pipe buffers can get filled up. If this happens, the pipe makes the sender wait until some space becomes available. Figure 1 shows this in more abstract detail:

A: Data enters the pipe: 1-2-3-4-5.
B: Data waits in the pipe.
C: Data leaves the pipe: 1-2-3-4-5

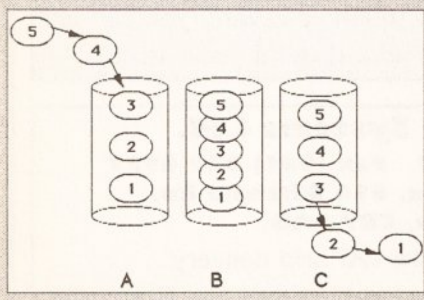


Figure 1, In a pipe (FIFO) buffer; data is let through in the order it comes in.

So what's a stack?

A stack can be thought of in several ways, but the most accurate analogy probably lies with the bullets in a rifle magazine. Bullets are added one at a time, and pushed down against a spring. As the bullets are removed either by firing, or manually, they are removed in reverse order. Figure 2 shows this more clearly:

A: Empty stack. Think of it as a spring-loaded bin.
B: Data in. As an item gets pushed on to the stack the hypothetical spring moves down to make space. Data has been placed (pushed) on the stack in the order: 1-2-3-4-5.
C: Full stack. At this stage, the stack looks just like the pipe.
D: Data out. Data is removed (popped off) the stack in reverse order since the last item in is the first one removed – hence the term, LIFO.
E: Back to the empty stack.

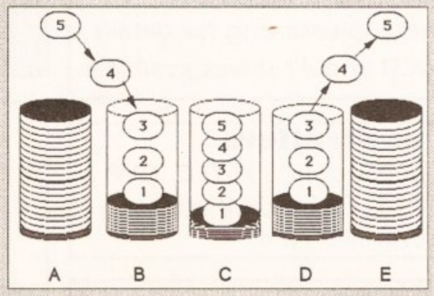


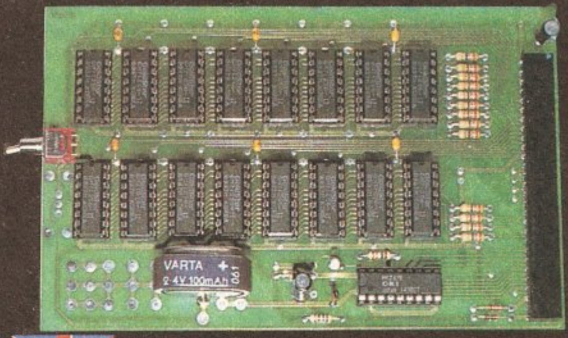
Figure 2, In a stack (LIFO) buffer, the last item in is always the first one out.

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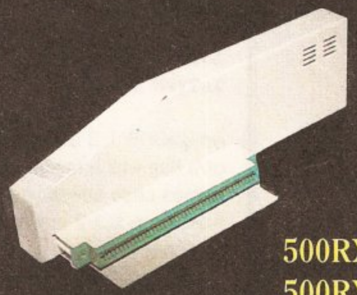
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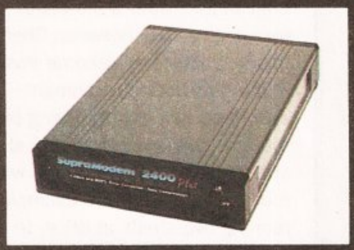
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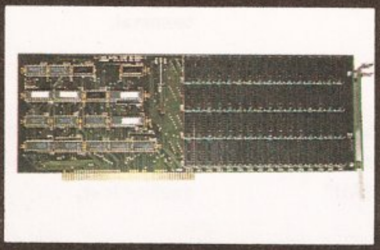
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continued from page 90

not the other way round. This gives rise to the theory, at AmigaDOS command level, pipes can be treated more or less like files.

PAYING THE PIPER

A pipe is a FIFO (first-in, first-out) buffer. You drop little packets of information in at one end and they appear at the other end in the same order. This can be compared to a stack where the last packet of data is always the first out. Consult the Beginners Start Here for more information.

At a very simple level, pipes are a software device emulation – so as far as AmigaDOS is concerned, pipes behave exactly like all other devices. This means you can create, write to, and read from a pipe just as you would a normal disk-based file with three important differences:

Writing:

- To disk: if a disk device is filled, the write operation stops and an error is generated.
- To pipe: if pipe device is filled the write operation is suspended until some space becomes available – some data is removed from the pipe. Furthermore if a different process tries to write to a pipe, AmigaDOS 1.3 overwrites the original contents. AmigaDOS 2 on the other hand, returns an "Object in use" error. In fairness, it would be highly unusual for two processes to share the same pipe name.

Reading:

- From disk: if a file does not exist, an error message is generated.
- From pipe: if a pipe does not exist, the read operation waits until some data is written to the pipe.

Random Access:

- Disks: Support random access so a file pointer may be positioned and data read from any point.
- Pipes: do not support random access. This does not affect the vast majority of users, but programmers should note this means the device does not support "Seek" functions.

NAMING PIPES

AmigaDOS does not support unnamed pipes. In the first example:

```
1>COPY S:SPAT to PIPE:
```

the pipe gets its name from the source file – however, for normal piping operations it is good practice to give each pipe a name. Since pipes are temporary, that is they only exist until they have been read, a single letter will usually be sufficient. Therefore a typical pipe operation might look like this:

```
1>COPY RAM:MyFile to PIPE:A
1>TYPE PIPE:A
```

AmigaDOS 1.3 users should be wary of a bug which makes the pipe names case sensitive. This has been fixed from 1.3.2 onwards so do not rely on it.

All this theory is fine, but it doesn't really explain what pipes are for. To use the jargon, pipes are intended for inter-process communication. Translated to English they offer a means of exchanging data between Shells and this is where they become invaluable in the dual-user environment described last month. Using pipes, the new chat system is very short but still requires a script. Users with one machine can try these examples by running two shells at once. In these examples, the "host" Shell's prompt is "1>" and the "remote" Shell's prompt is "2>". Enter the two scripts (Listings 1 and 2) and set the "S" protection flag on each like this:

```
1>PROTECT HOST-CHAT +S
1>PROTECT REMT-CHAT +S
```

Now enter the following. If you are trying this on a single machine, you will probably find it easier to open two Shells before proceeding. Also, make sure you enter the commands in the correct Shell window.

```
1>RUN HOST-CHAT
2>RUN REMT-CHAT
```

continued on page 94

JARGON BUSTING • JARGON BUSTING

ARP: AmigaDOS Replacement Project. The Microsmiths public domain replacement for AmigaDOS. Although slightly bugged in some areas, many users prefer it.

Asychronous process: A Shell-launched command which is doing its own thing – in its own time, regardless of what the parent Shell is up to.

Buffer: A temporary storage area or collection point – used to hold information which is waiting to be processed. Buffers used in the printer and serial interfaces as well as the disk drives and even the keyboard.

Data stream: A transfer of data from one place to another – usually between two or more devices. Literally like a stream or river.

Device: In AmigaDOS, a term used for a software interface to a hardware device such as a printer or disk drive or a software device emulation such as the console.

FIFO: First In, First Out. A pipe buffer.

Launch: To start a program or command from the Shell, CLI or Workbench.

LIFO: Last In, First Out. A stack buffer.

PIPE: A hollow tube used to direct flow of a fluid transfer between two places. In computer terms, pipes direct the flow of data.

Process: A command or program running under AmigaDOS control.

DUAL-USER DE-BUGGING CHART

Problem	Possible cause	Remedy
When connected to the remote machine, I get a load of garbage on the display.	Serial protocols not matched correctly.	Check protocols (baud rate, data bits, parity, stop bits) on both machines.
The "New Shell process..." message appears but I cannot get the Shell to respond.	The Shell has started on the host machine with output redirection to AUX:	Try again using: `1>NEWSHELL AUX:`
Every character I type appears twice, ie: `1>DDIIRR`	Local echo enabled on remote terminal.	Either disable the local echo facility or use the CHAT (split window) function if the software supports it.
When I enter a command (like STATUS) it returns a message like "Unknown command SAU"	Two (or more) Shells are sharing the AUX: device and characters are getting lost.	Enter: `EENNDDCCLLII` `<Space> <Return>` If that fails, you must reset the host machine and start again.
The Shell number changes every time I press return.	Two (or more) Shells are sharing the AUX: device	Enter: `EENNDDCCLLII` `<Space> <Return>` If that fails, you must reset the host machine and start again.
The first command I enter works, but then it all falls apart.	The Amiga is receiving carriage return characters (ASCII 13) in addition to the line feeds (ASCII 10) it expects.	Set the output carriage return (CR) translation to LF only.
Some commands return chopped up results with odd characters missing.	The two machines are not handshaking correctly. This happens at speeds in excess of 4,800 baud even with XOn/XOff handshaking.	Reduce the transmission speed rate to 4,800 baud or less on both machines or use RTS/CTS handshaking if your serial lead and hardware support it.

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LISTINGS • LISTINGS • LISTINGS

Listing 1 – HOST-CHAT

```
1. lab start
2. type pipe:A
3. skip start back
```

Listing 2 – REMT-CHAT

```
lab start
type pipe:B
skip start back
```

Listing 3 – CHATTER

```
.key NAME1/A,NAME2/A
Echo >T:qwe<$$> "Chat system opened as: Host=<NAME1>
Remote=<NAME2>"
More T:qwe<$$>
Run Execute S:Chatty
Lab Start
Copy Pipe:<NAME1> T:msg<$$>
More T:Msg<$$>
Skip Start Back
```

Listing 4 – CHATTY

```
.key NAME
Lab start
Type pipe:<NAME>
Skip start back
```

continued from page 92

```
1>ALIAS CHAT COPY * TO PIPE:B
2>ALIAS CHAT COPY * TO PIPE:A
```

The first two lines start the pipe-based chat system as an asychronous process. Once activated it cannot be turned off, but the operation is completely transparent. Note also, both programs must be run before an inter-shell conversation can take place. The last two lines might seem a little strange, but rely on a feature of ALIAS whereby aliases are local to the Shell process in which they were created. In other words, "CHAT" in Shell 1 will execute the command:

```
COPY * TO PIPE:B
```

and "CHAT" in Shell 2 will execute:

```
COPY * TO PIPE:A
```

This version of COPY may seem unfamiliar because the source file is an asterisk – normally used as a wildcard character in other systems. Under AmigaDOS, the * used in this way refers to Shell window; specifically, take input directly from the keyboard and copy it to the named pipe. When this command is executed, all keyboard input is directed to the pipe. To return to the Shell, you must enter the EOF (End of File) sequence by holding down CTRL and pressing \. This forms the basis of the chat system.

Assuming you have started the chat scripts in two Shells as detailed above, you can now start chatting. Try this:

```
1>CHAT
Hello World
Is anyone out there?
[Press CTRL+\ here]
1>
```

All being well, that message will appear instantly in the other Shell window:

```
2>Hello World
Is anyone out there?
```

The same command can be repeated from the other Shell to reply or send another message. Note the prompt (2>) will not appear in the receiving Shell after the message. This is quite normal and does not affect the Shell's operation. Pressing return in the receiving Shell will return a prompt. An interesting feature of AmigaDOS is that once you start typing, the chat system is disabled – it won't interrupt half-way through entering a command line.

The scripts themselves are extremely simple. Here is a description of Listing 1.

1. Defines an arbitrary label for the script to jump to when it loops.

2. Serves two functions. First, if a message is waiting in the pipe, it is displayed (typed) immediately. Second, if no messages are waiting, TYPE halts until one appears. This is an action of the pipe device – not the command.

3. The script only reaches this point after a message has been posted to the receiving pipe (above) and displayed. After this happens the script is sent back (via the label at Step 1) and waits for the next message at Step 2.

MORE PIPES

Unlike MS-DOS and UNIX, AmigaDOS does not support unnamed pipes where the output stream of one command can be connected to the input stream of another. Hence the MS-DOS construct:

```
TYPE READ.ME | MORE
```

is not valid in AmigaDOS and has no direct equivalent. (The bar "I" symbol is used in MS-DOS to signify a pipe.) The nearest alternative is to do the command in two steps thus:

```
1>COPY READ.ME PIPE:A
1>MORE PIPE:A
```

or, alternatively:

```
1>TYPE >PIPE:A READ.ME
1>MORE <PIPE:A
```

Note: the ability to use unnamed pipes, is documented as part of the ARP 1.3 release and is claimed to work with the Shareware Shell replacement, Conman. ARP 1.3 users may want to try this out for themselves.

The MORE program exhibits different behaviour depending on whether it is launched directly or as a separate process via RUN. Try this:

```
1>MORE S:SPAT
1>RUN MORE S:SPAT
```

Notice in the first instance how MORE uses the current Shell window, but when RUN it opens a window of its own. This feature may seem pointless, but it allows MORE to be used over the serial port. Moreover, it also gives rise to a variation on the CHAT theme. Listings 3 and 4 form a "Chat" system which is designed to be launched by the remote system and initialise all the pipes. It cannot set up the CHATTO alias – this can be done in Shell-startup, by adding the following lines:

```
ALIAS ChatTo COPY * TO ↵
PIPE:[]
ALIAS ChatNow RUN EXECUTE ↵
CHATTY
```

To start the chat system, the remote operator enters (for example):

```
1>CHATNOW DAVE PAT
```

The host terminal then receives a message (via MORE) like this:

```
Chat system opened as:
Host=DAVE Remote=PAT
```

Dave (using the host Amiga) can now start chatting to Pat:

```
1>CHATTO PAT
Hello Pat!
```

and send the message by pressing CTRL+\ as described earlier. Similarly, Pat can chat back to Dave like this:

```
1>CHATTO DAVE
Hello Pat, "Shellie" causing
bother again?
```

Don't forget, you must enter "chat" mode every time you want to send a message. Next month, I'll be describing exactly how these scripts do their job. Until then, happy chatting! AS

AMIGADOS MASTERCLASS – MID

If you create a new directory from AmigaDOS, it does not receive a Workbench icon. This short script – MID for Make Iconified Directory – will rectify that. Note however, because the Drawer icon is copied using AmigaDOS, you will need to use the Workbench Clean-up and Snapshot functions before using it. Note also, this script is only suitable for machines fitted with AmigaDOS 1.2, 1.3 or 1.3.2.

Use your favourite text editor, even ED, to create the script and save it as S:MID (no pun intended). AmigaDOS 1.3 and 1.3.2 users should set the "S" protection flag to get the best from this command.

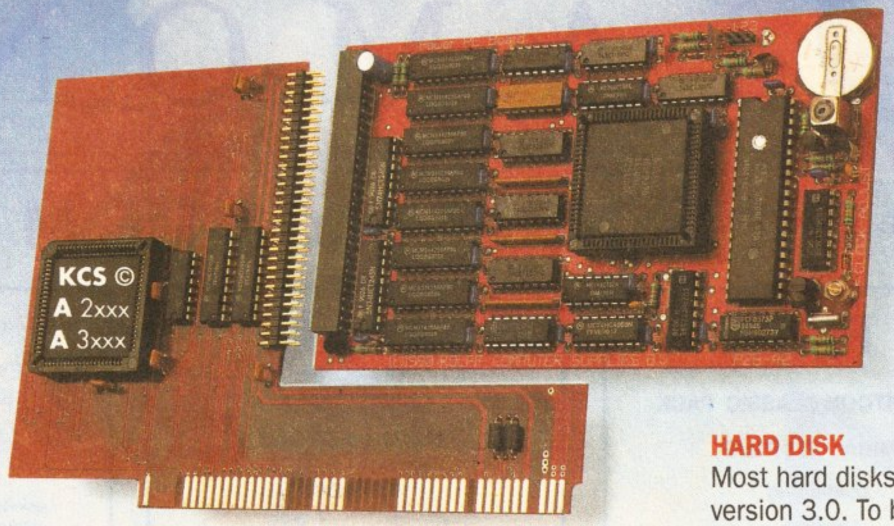
Usage: MID <name of new directory>
Example: MID DF1:Toolkit

Listing 5 – MID

```
.key name/a
.bra {
.ket }
MakeDir {name}
Copy SYS:Empty.info TO {name}.info
```

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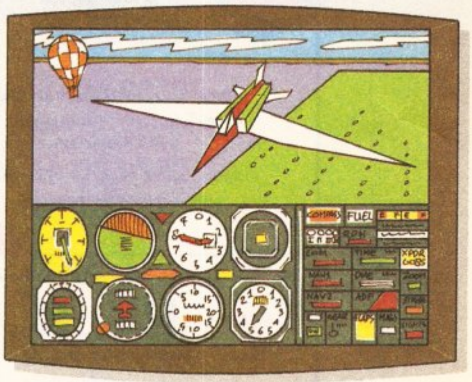
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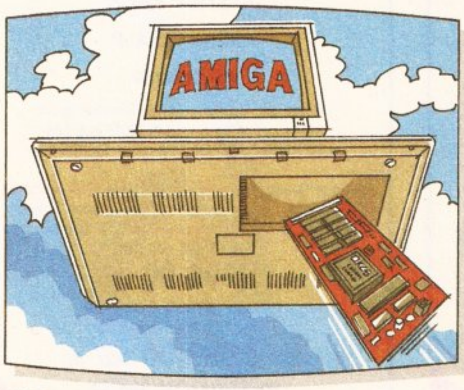
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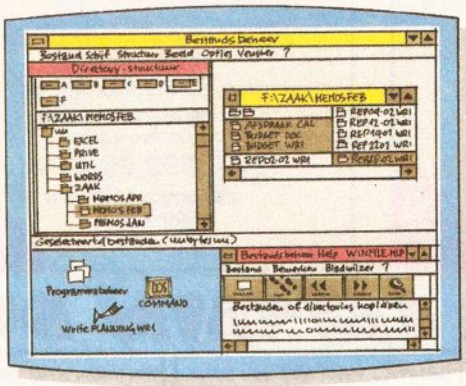
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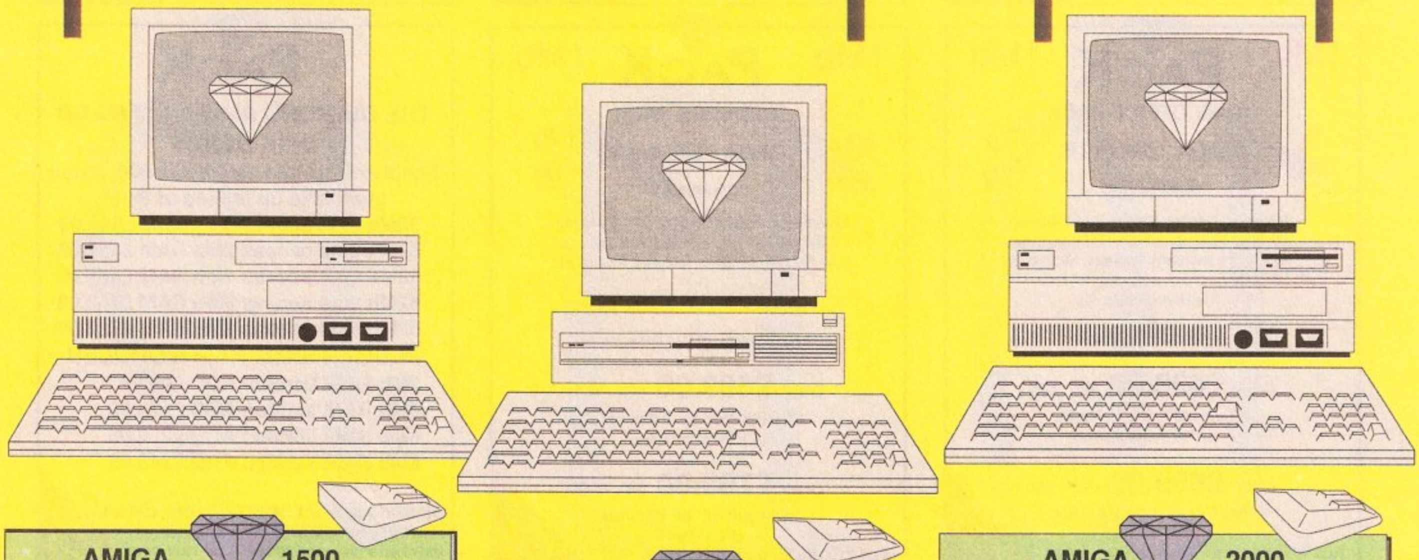
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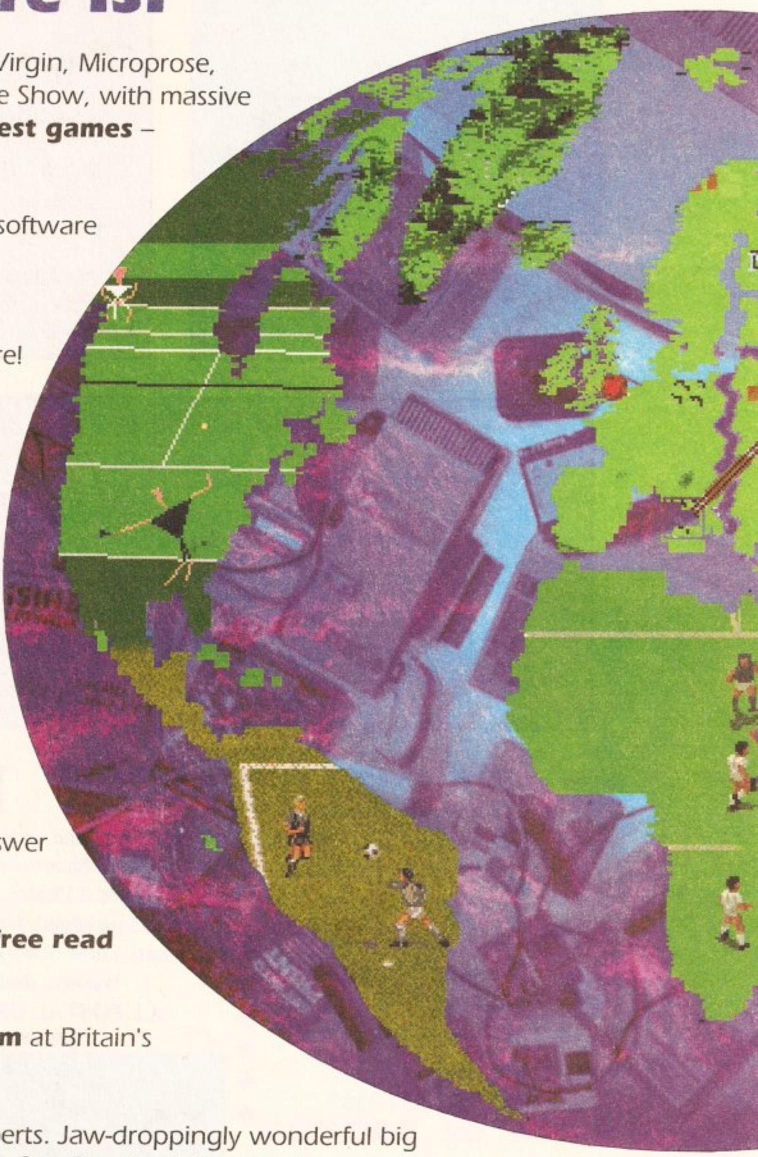
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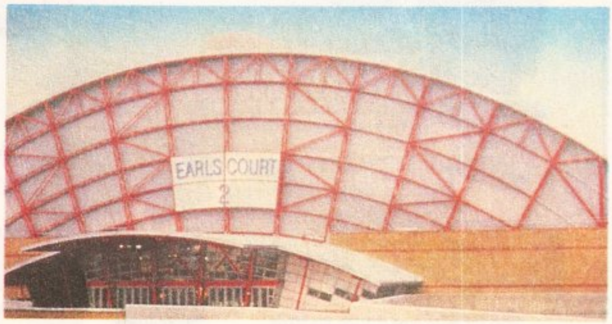
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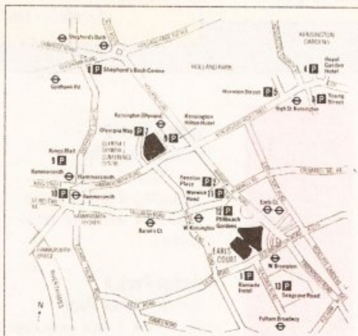


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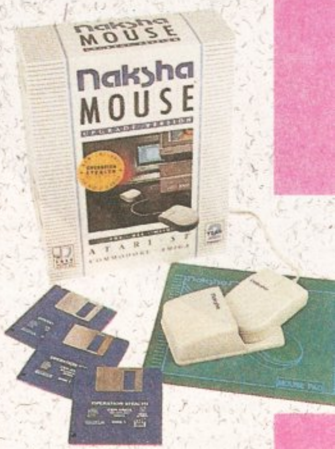
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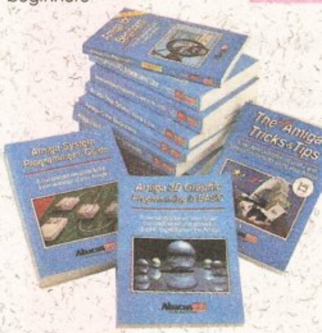
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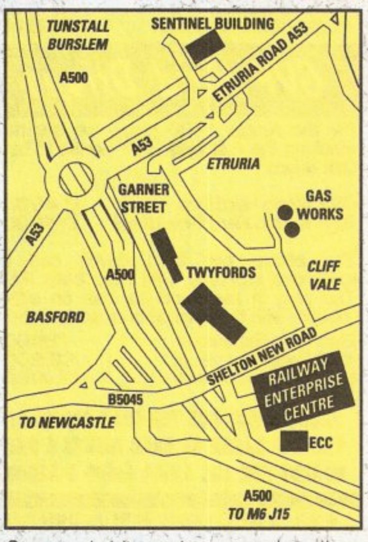
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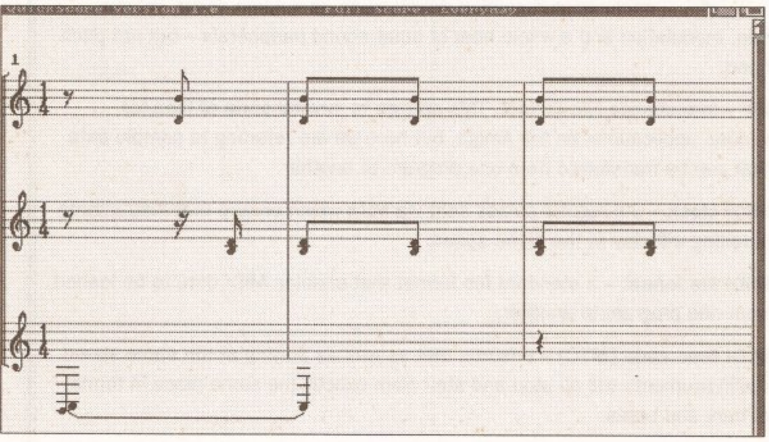
Jon Bates gives an in-depth review of the latest sequencer from the Dr T's stable: KCS 3.5

Dr T's is one of the oldest, dedicated music software houses in the business, which makes it about seven or eight years old. One of the company's earliest programs (for the Commodore 64) was the *Keyboard Controlled Sequencer*, well, we're seven years down the road and the program still lives on – or at least, the basic screen and some of its concepts. *KCS* has been expanded and adapted on virtually a twice-yearly basis, way beyond its original form.

The latest Amiga version is 3.5, and as well as *KCS* itself, the disk includes the new style of graphic editor, *Tiger* – a sophisticated and automated mixdown program – plus *Quick Score*, a program for printing out a first draft copy of your work. Financially, this is a good deal as, purchased separately, the programs would amount to over £500.

KCS has three main modes of working: Track, Open and Song. We'll take a look at each section first and then see how they link together.

The default screen is always the Track page. The screen is divided up into three areas: tracks, control panel and a message line which displays the last function selected. There are 48 tracks to work on, and there are quite a few innovative features. Any track that is playing is indicated by small notes that change colour. The program uses the conventional icon-style transport controls to select record, playback, fast forward and so on. The current song position is read off in both bars, beats and steps and minutes and seconds. Situated between these is a visual beat display that highlights the first beat of each bar.



By using *QuickScore*, you can see and print the complete piece out in traditional notation.

On the subject of 'steps', the highest recording resolution – ie the accuracy of the program – is 384 pulses per quarter note. Each quarter note (crotchet) is subdivided into 384 miniscule segments and can be very finely adjusted in time. Another way of looking at this is to say that a common-or-garden, four-beat bar is scanned 1,536 times and *KCS* places each item of MIDI data precisely as it occurs. It should be noticed that this value is variable and that *KCS* defaults to 240 ppqn – this is the preferred resolution that Dr T's recommends for reasons of clock timing and the overall design of *KCS*.

The other on-screen icons cover useful controls to speed up the process of actually getting tracks down; definable cue points within the music, punch in and out, a live editor and so on. In total there are 17 different functions that you can apply to each track.

The default method of recording is that the program takes the length of the first track you put down as being the length of the music and starts recording when the first note is input. When you finish the first track, it then loops round and allows you to record straight away on the next available free track without stopping. An extension of this would be the ability to pre-define MIDI channels for tracks and jump through them so that you didn't have to stop to change channels to call up different instruments.

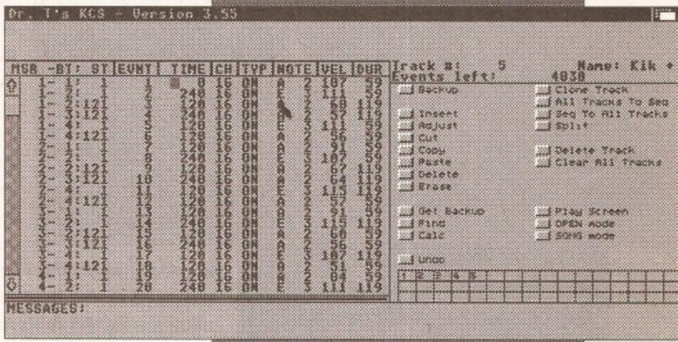
To change MIDI channels, you scroll through using the arrows situated on the lower left of the screen. 'Rechannelise On' is the usual way of working, the altered channel data being simultaneously output to the sound module/ synthesiser. Other data can also be altered in real time. Both aftertouch (the pressure applied to the keys after the initial strike) and controller data such as modulation can be filtered out before it is recorded. Many sounds do not require aftertouch and the data filtered out saves on memory space. If you wish, you can quantise the notes as they arrive. This, however, is a one-shot deal and you can't go back to the way that you actually played them. I found the best way of working was to record without quantising and then fix up the tracks afterwards in edit mode. Quantise is straight-forward and asks you only to select the number of steps to which you want it to round the start of each note. However, I would prefer this value to be displayed in some form that relates to note durations, and not the number of steps the computer is taking. There is no provision for adding a 'strength' of quantise, which is often seen on programs of this stature, either.

Of course, you can set up the environment to default to your preferences. Most of the 'full environment' options can also be set from the drop-down menus in the Track screen. I particularly liked the ability to mute the last track recorded, as in 'cycle record' mode. This means that you can perform sections endlessly

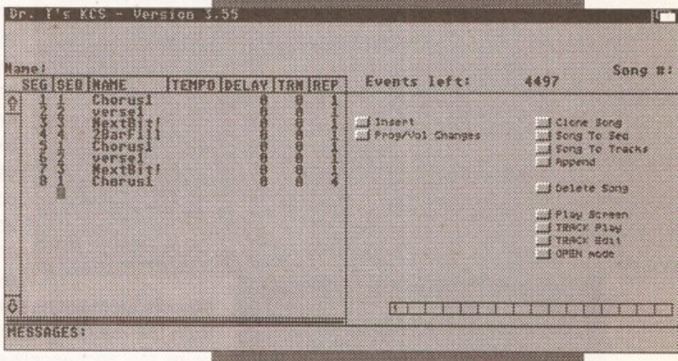
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"*KCS* has been running longer than any other sequencer in the business. Has it finally run out of steam or does this version still have the edge over the rest? I'm putting it through its paces to find out."
Jon Bates



One of the tracks in the edit screen. This is the rather stodgy data editing version, although there are plenty of useful options on the screen right.



Short sections of music have been recorded in track mode and each one turned into a sequence. The Song page above links them together with many smart features.

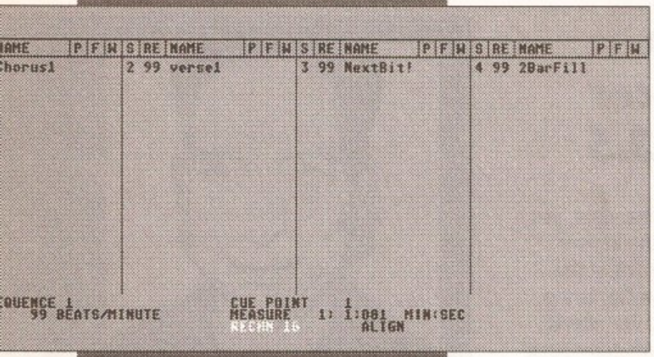
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without the software getting in the way of the creative process. You can also define the length of track to be recorded or just simply leave it open by setting an overlong length. Other features allow you to merge tracks, split tracks by note or MIDI channel, filter MIDI channels on input, remove note-velocity data and punch in and out of a track at preset points. The terminology is borrowed from conventional recording practice, where a section of a track is 'punched' – in other words, part of it is replaced. *KCS* very wisely mutes the original track and puts the new section on a separate track. In this way you can have many 'retakes' until you feel it is correct and you have never lost the original. The ability to print out a 'map' which corresponds to the status of the piece: how many tracks are used and what channels and instruments they play, what each sequence is called, what order they have been arranged in and how much data they use, is a useful feature.

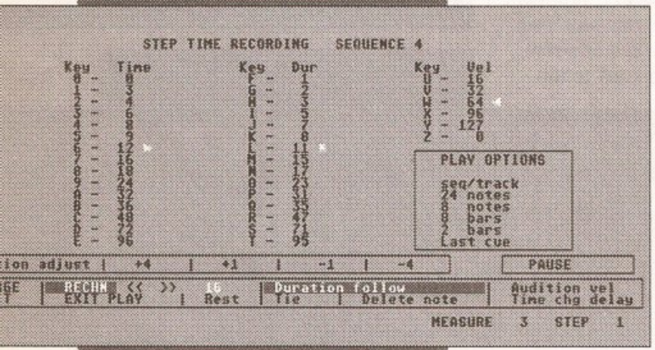
KCS does not neglect the internal sound chip on the Amiga. An 'internal sounds' page will allow up to 16 sampled instruments to be on-board at any time in IFF format. Each sound can be allotted its own MIDI channel, volume setting, transposition and keyboard range. Although velocity-sensing, these samples do not respond to other MIDI controllers such as pitch bend, aftertouch and modulation. The sounds themselves can be played from the inputting MIDI keyboard by using the 'rechannelise' button. As is the case with the Amiga's internal sound chip, you can only have a maximum of four sounds running simultaneously. Since they have been allotted MIDI channels, you will need to turn any MIDI channels or other tone modules that are linked into the system off, otherwise a combination of the two sounds will occur.

The edit page of *KCS* itself is dogmatic and not very user-friendly. All the notes of each track are listed as data; you can play each track separately in this mode, but you can't hear the other tracks at the same time. To do this you have to be in Open mode, which is a form of macro track recorder which displays the data for all the tracks in one big data stream. In both Track and Open modes you can define points within the stream that can be looped. This is the only way of identifying bum notes and other problems. The screen is static and it can sometimes be difficult to work out whereabouts you are in the edit page. However, the edit options for manipulating and altering data are very comprehensive; it is only the actual finding of specific notes where the program falls down. Corrections made in the Open Edit mode are not automatically cloned by the individual tracks of Track mode, so there is a degree of flexibility here in that you can work on several versions of the same section of music. The way to get around this numeric and rather pedestrian editing is to use the *Tiger* – more of which later.

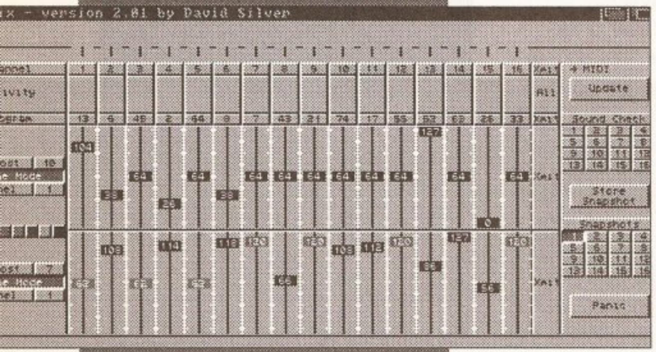
Having created, say, an 8-bar pattern in Track mode, you can store this away as a named sequence. One slick way of working here is to make several versions using the mute functions to stop different tracks playing. Each combination of muted and sounding tracks can be



The Open mode. You can use a combination of sequences, as shown here, and record new tracks alongside them. These are controlled by other tracks.



Step entry is made easy by the most common selection of note values presented in a list.



The AutoMix screen: the bottom row of sliders controls the volume of each channel and the middle row puts the sound in a stereo picture. Program changes are sent above and active channels indicated at the top.

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Control numbers – the part of the MIDI code that carries information regarding details such as sustain pedal, volume, pan, modulation and a whole host of other sound peripherals – but not pitch bend.

IFF – Interchange File Format. This applies to several sorts of files for various applications on the Amiga, but here we are referring to sample data that can be transferred from one program to another.

MIDI clock – the regular pulses sent via MIDI which ensure that instruments listening will play at the same speed.

MIDI file format – a standard file format that enables MIDI data to be loaded from one program to another.

MIDI time code (MTC) – ensures that as well as playing at the same speed, the instruments will all stop and start from exactly the same place in terms of bars and beats.

MIDI – Musical Instrument Digital Interface; the universal standard by which digital instruments such as synths and computers can communicate.

Modulation – often controlled by either a wheel or side-to-side movement of a joystick. This will alter the sound according to the way it has been programmed, usually in the form of a vibrato – the note wavers in pitch, and the amount it does so is controlled by the modulation control.

Multi-timbral – the ability of a synth to play different notes using different voices (timbres) at the same time, usually on separate MIDI channels.

Pan – corresponds to the balance control on your stereo system, moving the sound from left to right. MIDI is able to control this and position the instrument or move it about – provided that the output from the synth or module is stereo!

Pitch bend – the ability to vary the pitch of a note up or down by using either a wheel or joystick-type control mounted on the synth, usually to the left of the keyboard.

Quantise – to round up data, usually meaning the correction of timing errors. Notes that have been entered out of time can be pulled into line according to how the software has been set.

SMPTE – Society of Motion Picture and Television Engineers. A time code standard used in video, film and television. If a sequencer is to be used in conjunction with these media, it will need to be able to synchronise to the several formats that SMPTE has.

Systems exclusive – the part of the MIDI code that transmits data which carries direct information to program the sound chips. It will only apply to the make and model of instrument it is addressed to.

stored as a separate sequence and may be transposed – there is provision to designate some channels as drum channels which will be ignored by the transposition feature.

Song mode allows you to string created sequences together and set the number of repeats, transposition, delay in time and even alter the tempo within the track.

The overall idea is that pieces of music are created in the track mode, edited, and then turned into sequences. These sequences can then be chained together in the Song mode to form a complete piece of music. At any time, you are always presented with a very flexible way of working – you can turn a song into another sequence and chain that in turn with other sequences. You can transfer them back to the Track page for fine editing and alterations. Of course, it is perfectly possible just to stay with the Track page and make up pieces in that manner, using the cue points to start and stop recording.

Open mode is a combination of both Song and Track mode and is a very variable way of creating music. It lets you define up to 128 independent sequences, any number of which can be played back simultaneously. Open has two pages, the edit screen and the play/record screen where all the sequences recorded so far in the session are listed along with complete details of their status and size. You can try out any of the sequences together prior to setting up control tracks to define the number of repeats, stops and starts. This is an extremely flexible and powerful way of working – once you get used to it.

Sometimes it is more convenient to enter notes in what is termed Step Time (as opposed to real time), entering each note individually. Each note is played on the main keyboard whilst the Amiga keyboard is used to specify the timing and duration of each note; the velocity can be entered from either. *KCS* has a separate screen for this mode, and you have 15 choices of note timing and duration plus six levels of velocity. All of these are adjustable and can be saved as part of the full environment/default set-up.

The flexibility of the program allows you to use this method from either Track or Open mode, and you can even blend real and step time recording together on one track by using Step Time Append, which inserts or adds a step time section to an existing real time track. The position of the note in the bar can be changed as you go along, and *KCS* makes intelligent alterations to the note values in order to make musical sense. Like many of the facilities throughout the program, you can override this if you wish. You can choose to either play back the last few notes or the whole track. *KCS* has probably the most well thought out and helpful step time entry page of any sequencer – the result of several years of user feedback and some inspired design.

My only gripe is again that the note values are given in steps relative to the computer and not to musical values; this all takes a little time to get used to.

KCS supports MIDI clock synchronisation and also Song Position Pointer, which means that it can link up to other external sequencers, and start not only from the beginning of a piece but also pick up from any bar and beat. It also supports SMPTE time code by use of

> **"The whole KCS 3.5 package is a very comprehensive and powerful set of musical tools"**

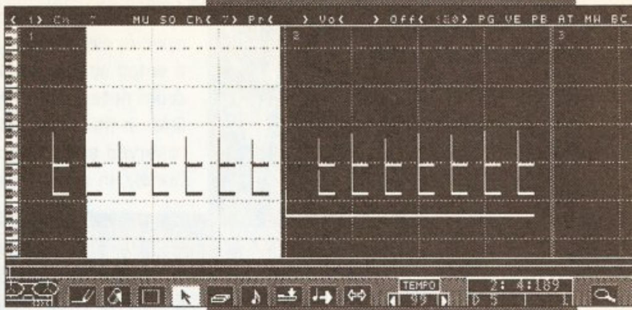
the company's own Phantom interface. This is not only a MIDI interface unit but also a SMPTE reader and generator. The software is provided as part of the *KCS* package but you will have to pay extra for the interface. This version of *KCS* now contains dedicated instructions for the Fostex MIDI sync box, the MTC-1. This sends out commands for the Fostex series of multi-track tape recorders; it not only controls the transport and recording controls of the machine but it will also locate – not only in SMPTE time code but also in bars and beats, providing a truly integral recording suite. Readers who are owners of Fostex machines should consult their dealer to see if this is possible, as it is only later models that are compatible with the MTC-1.

Dr T's has developed its own Multi Program Environment (MPE). Although the Amiga is an excellent multi-tasking computer, MPE goes a stage further in that it hooks up programs that are running simultaneously. For example, if you load up the *AutoMix* program, changes made there are recorded in *KCS*. The same goes for all other Dr T's programs that support MPE. Naturally, you can run other software programs from different sources, but they will not have the intimate connections with one another that these have. This is how the package under review is linked together; *Quick Score*, *AutoMix* and *Tiger* are separate programs in their own right but are linked together when running under MPE. MPE will support up to 20 (!) programs running together, and to overcome any problems in memory management a 'raise priority' command will give *KCS* preference over any other software resident to give greater accuracy when transferring tracks to tape. The payback is that you will need a fair amount of memory to cope with this level of sophistication. Sadly, *Tiger* and *KCS* will not run together with 1Mb of RAM; a minimum of at least 2Mb is recommended, and for the full treatment you would be looking at 4Mb.

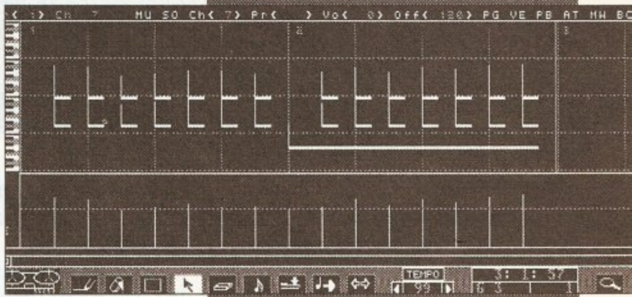
AutoMix (the version reviewed is actually *AutoMix II*) is what is termed as a 'virtual slider' facility. It consists of 32 screen sliders that both send and display MIDI controller data as well as some extra controls. Arranged in two banks of 16, with activity meters above them showing what tracks/channels are active, the display resembles a mixing desk, which is what its prime function will be.

The upper set of faders default to controlling pan, and the lower set to the output volume of each MIDI channel. These functions can be altered at will to any of the MIDI control numbers to alter any other sound peripherals such as sustain, modulation, chorus and tremolo – or indeed any other control function that your instrument may respond to. Each bank of sliders has 16 screen buttons which you can 'snapshot' in

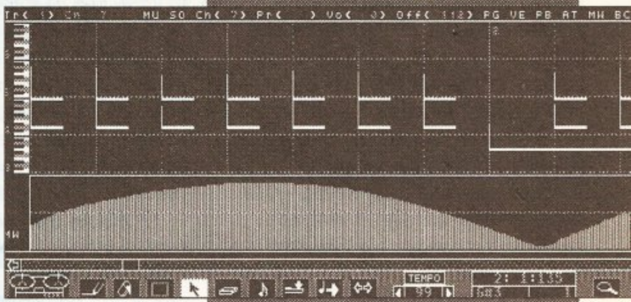
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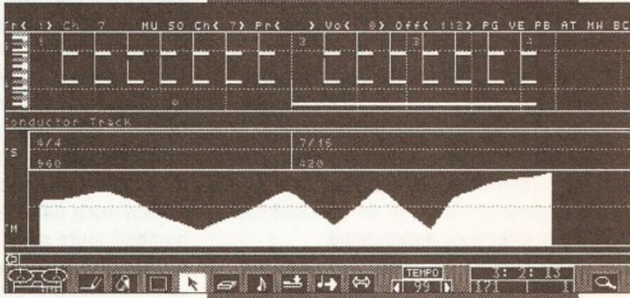
The *Tiger* graphic note display: much easier to work with, and the inverse section is about to be edited.



Under the notes are their velocities: it's easy to re-shape them with the cursor this way.

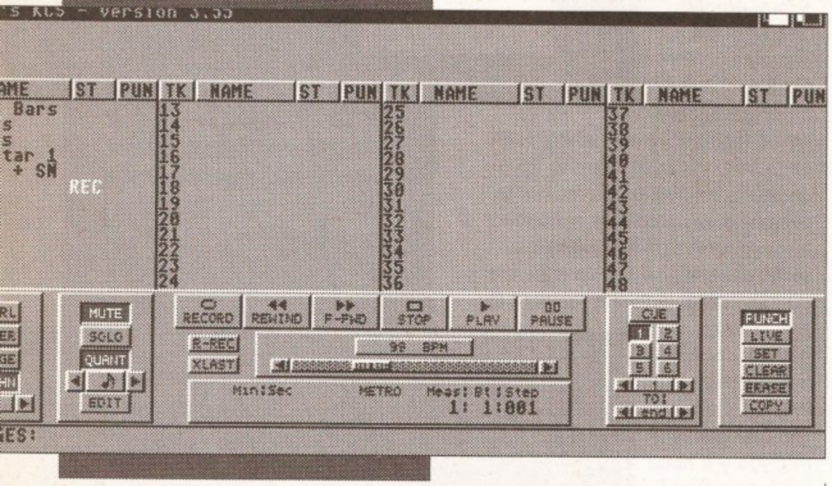


Aligned under the notes is a shaded control drawn by hand. In this case it will alter the modulation applied to the sound.



Here, the graph alters the tempo of the piece as it plays along. The time signature can also be changed in the upper line.

The default track mode of *KCS 3.5:* track 1 designates the length of the sections and the recorded instruments are listed below.



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different positions and then send to *KCS* (or MIDI). You can also choose to record fader movements as part of a sequence; playback imitates these screen movements. Faders can be colour-coded and grouped together in four separate sets to make automated mixdowns easier – in effect imitating the sub-group facility on a real mixing desk. Any 'remixes' will override previous slider data recorded. Program changes can be sent at any point and set up as part of the 'snapshots', which are stored as part of the total file. One useful addition here would be the ability to name the faders instead of having to remember what fader/channel controls what particular sound – this is made more complex if program, and sound, changes are included within a piece.

Dr T's markets a couple of scoring packages: *Copyist Professional* and *Copyist Apprentice*, both of which will run under MPE. The halfway house is *Quick Score*, included in this package, which creates traditional scores from the tracks recorded in *KCS*. Although you can view and print either complete scores or individual parts in standard notation, it does not have any note-editing facilities.

Although note-altering is not one of its features, you can massage the appearance to make good musical sense. You can select clef, time and key signatures, whether the track's appearance needs to be transposed, stem direction, appearance quantisation, corrected syncopation display and bar line display. Whilst this is a far cry from a music setting program – and it is not an attempt to be one – it is nevertheless quite adequate for many situations where the bare musical bones are required in a hard copy form.

Percussion parts have their own special clef and – a good feature for a small scoring package – each drum note/instrument is allotted a line on the score and has special reserved symbols (pun unintentional). In some instances you may well have to juggle about with your drum machine in order to make full use of this.

Tiger is an acronym (nearly) of The Interactive Graphic Editor and makes full use of the graphic display to edit not only notes but nearly all other MIDI data as well by displaying note and controller information in graphic format. Although not immediately intuitive, it is nevertheless an easy animal to get to know and as long as you remember what the icons at the bottom edge of the screen actually mean it is not too much of a problem. As always, there are several ways of entering the main commands which, once learnt, makes for a fast editing procedure.

The note display is somewhere between graphic blobs and traditional notation. L-shaped characters represent each note, the height of the stem equals the velocity with which it was hit and the length of the note represents the duration. The screen scrolls from left to right, and set against the left-hand edge is a vertical piano keyboard which gives you a reference quite apart from the note display on the bottom of the screen which logs the position of the cursor at all times. The program displays one track at a time, and tracks can be pulled in from the text area running across the top of the display. This also holds data appertaining to the current display such as MIDI channel number, Mute selection, Track name, current program change number, volume level and if there is any track offset (the point at which the first event occurs).

The playback functions are fairly extensive, since tracks can be soloed, muted and otherwise grouped for playback purposes. To play back all the tracks, simply hit the space bar. If you want to hear just a couple of bars, point the cursor at the required start bar, enter the number of bars you want to hear on the numeric keypad and away it goes. Cue points can also be set up. The display will support the full 384 ppqn resolution but defaults to 240; mind you, at 384 ppqn the bar length on the screen will be rather unmanageable.

There are many ways of actually selecting notes for editing operations. Individual notes (which need not necessarily be adjacent) are picked up by the 'point-and-press' method, multiple notes are chosen by dragging across the required area. This can be further limited by setting a note range. The usual cut and paste facilities are available for copying and inserting sections. Once an editing field is selected you can alter pitch, duration, velocity and note values. The pitch of the notes can be inverted around a central point for striking counter melodic or Schöenberg-style impersonations, and the actual order of the notes can be reversed. To help you select notes there are several zoom resolutions that display more or less of the track in one go.

Quantisation is considerably enhanced from that seen in *KCS*. Once notes have been selected you can quantise them by note value, and then offset the whole track slightly to 'push' it. You can also give tracks a percentage of 'swing feel' – that almost imperceptible shift of rhythm that takes the feel of a track from a Handelian courtly dance via the Count Basie Big Band school of swing to the delicate heads-down-no-nonsense approach favoured by Guns N' Roses and Motorhead.

Perhaps the most original feature is the ability to specify controller tracks and then actually draw in the functions as you want them to apply to the track. For example, if you want to put modulation on an instrument you can modify or recreate the effect from scratch by setting up a control track for that function and then use the mouse to draw in the degree of modulation required over any time scale. Very simple to use and very accurate. It can be applied to any of the MIDI control functions and the most usual of these are listed in the text display at the top of the screen to save you looking up the control number. Velocities and aftertouch can also be displayed in a succession of upright bars underneath the notes, and these can be smoothed out and re-jigged however you like.

Tiger represents a very friendly face for editing, and one that will possibly be preferred by users of this package.

The whole *KCS 3.5* package is a very comprehensive and powerful set of musical tools, and one that gives the user a vast choice in the approach he or she might want to take to music sequencing. Although some features seem a little obscure, when once you start using them they do seem to make a lot of sense and become quite easy to adapt to. The package supports MIDI files as well, so the whole gamut of off-the-peg tunes as well as IFF samples is at your financial fingertips.

At present, Dr T's is exploring the possibility of expanding the Phantom interface to include multiple MIDI ports. This is an area that Amiga MIDI interface designers are working on standardising, and will mean that you will be able to address several sets of 16 channels independently: MIDI A, MIDI B, MIDI C and so on.

Zone Distribution is making a part-exchange deal with *KCS* at present: owners of *Bars and Pipes* or *Music X* can get the package for £149, while £179 is the price set to entice owners of *Sequencer 1* and other similarly-priced sequencing software. AS

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Documentation ●●●●○
Comprehensive and easy to understand.

Functions ●●●●●
Copious and plentiful; some quite inspiring.

Speed ●●●●○
No nasty unwanted pauses.

Ease of Use ●●●○○
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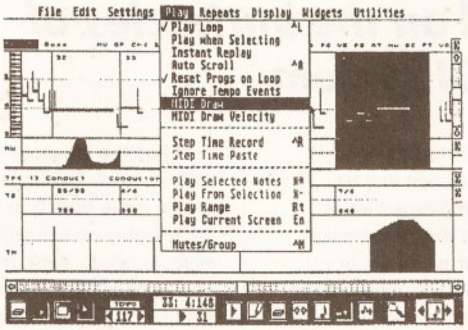
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Here's what one reviewer had to say;

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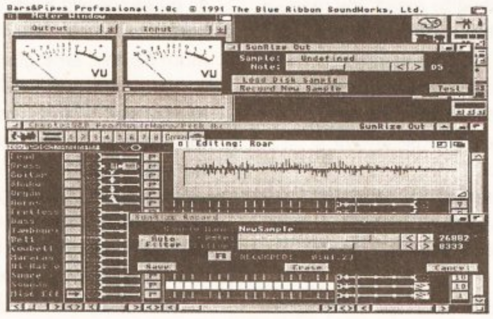
Paul Overa, Sound On Sound Oct. 1991

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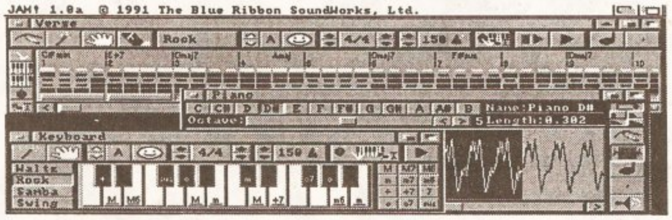
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Get into MIDI 2

Paul Overaa continues his tutorial on the intricacies of the MIDI system



"MIDI is an extremely powerful way of connecting synthesisers and computers together. Unfortunately, it can also be rather complex – which is where this series comes in."
Paul Overaa

One of the things I mentioned last month was the fact that the modern-day synthesiser can create an enormous variety of sounds. Whether you want violins, drums, brass instruments, harmonicas, whistling or dogs barking you can bet your life that even the simplest synthesiser could be programmed to produce good likenesses of such sounds.

With a MIDI keyboard, digital messages will be transmitted as the keyboard is played, and the first point that needs to be made this month concerns the relationship between the sounds you hear when you play a synthesiser, and the MIDI messages which are transmitted.

MIDI notes themselves are 'timbreless' – that is, they are not physically related to any particular sound or synthesiser voice. You can therefore record a melody with your synthesiser set up for a piano sound but if, before playing it back, you change the synthesiser's voice to, say, a bass guitar sound then the melody you recorded will now sound like a bass guitar.

The reason I've mentioned this is that this month I need to talk about voices, voice selection and the slightly more complicated ideas involved in using the multi-timbral synthesisers. For a number of reasons this is also a good time to look at a particular piece of transmittable MIDI information called the 'program change command'.

A program change command is a MIDI message which allows a synthesiser's current voice to be changed by remote control. A sequencer, by sending such messages, can therefore select suitable synthesiser voices without anyone needing to make any manual changes to the synthesiser controls. As likely as not your synthesiser will also transmit these messages whenever different voices are selected from the instrument's control panel.

Let's examine the program change message as defined by the MIDI standard – take a look at Figure 1.

The program change message is a two-byte message. The status byte identifies the message type and a MIDI channel. The trailing data byte gives a value from 0 to 127 decimal, which indicates a program change value. In effect, then, these messages allow the selection of any one of 128 different possible 'programs'. For instance, the two bytes C0 hex (decimal 192) followed by 0 hex (decimal 0) tells any unit set to MIDI channel 1 to change to its program 0 voice arrangement setting.

Some synthesisers have a fixed program change/voice relationship, so that sending a 'program change 1' message will always select a particular voice. Other units employ more flexible arrangements, often based on user-definable, internally memorised tables. The benefit of this latter arrangement is that you, the user, can not only choose which voice a particular program change command will select but you may edit and change such tables as and when it becomes useful to do so.

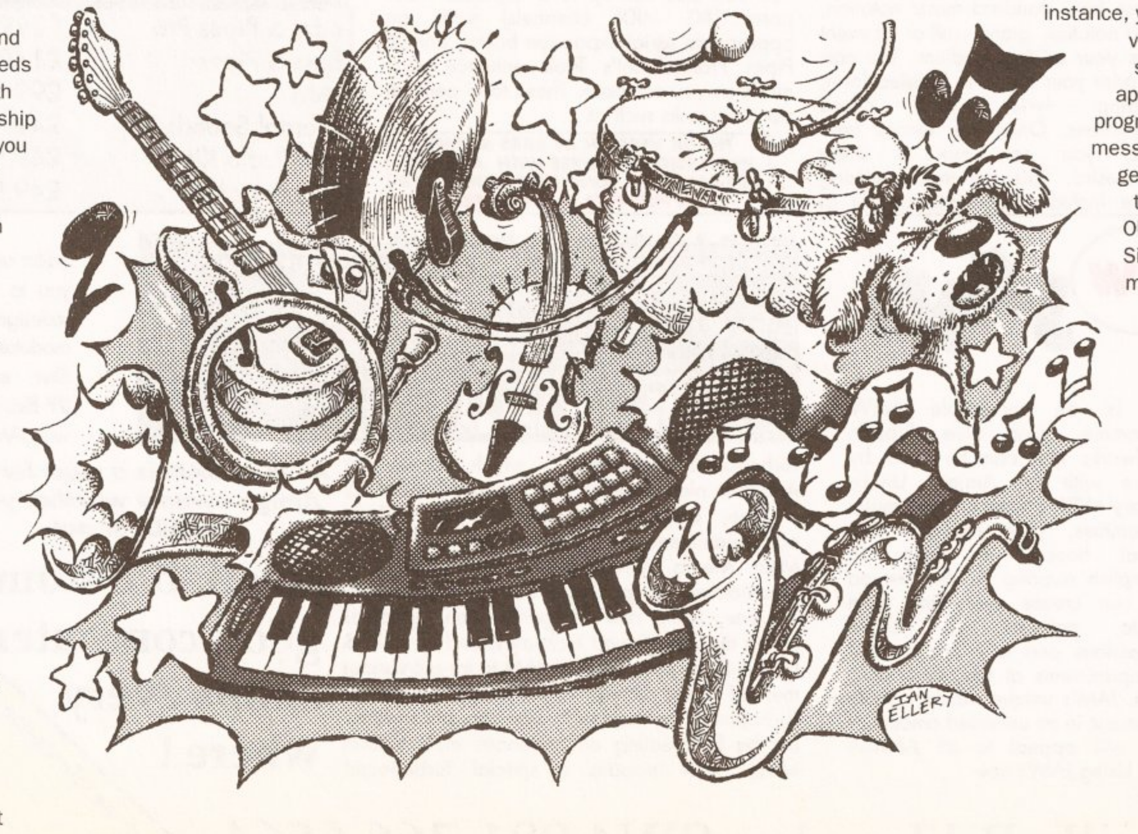
The program change/voice correspondence is essentially numerical, with program change numbers effectively just identifying slots in a synthesiser's voice/program memory. Program change numbers therefore have nothing directly to do with the various audible sounds that a synthesiser can make.

The important point is this: as far as the MIDI standard is concerned, the general relationships between any one particular program change number and the characteristic, audible sound of a particular voice is not defined. On one synthesiser a 'program change #3' message might select a piano voice, while the same message sent to another synthesiser might select an oboe voice.

To be honest it would, given the infinitely wide range of sounds that all synthesisers can produce, and given the fact that many voice settings are user-programmable anyway, have been impossible to implement any scheme which involved associating a given program change number with a particular type of sound. It is therefore up to the user to find out how the voices of your synthesiser are related to the available range of program change messages.

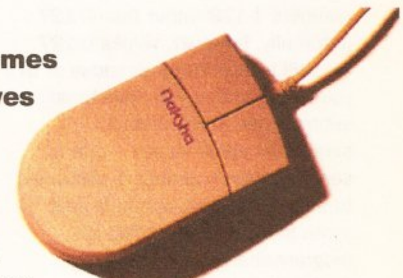
Once a set of voice/program change number assignments have been identified or created, you'll usually find that the correspondence will work both ways. When, for instance, you manually select voice X on the synthesiser, the appropriate MIDI program change message will be generated and sent through the MIDI OUT terminal. Similarly, if that same message is received at the MIDI IN terminal of the synthesiser, it will automatically change to voice X without you needing to touch any of the synthesiser's controls.

Program change numbers, incidentally, are often called 'patch numbers'. This stems from the good old days when synthesisers had connectors



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with masses of leads used to route or 'patch in' different parts of the synthesiser circuitry. At a later stage, synthesisers became modular and switches were used to route the signals but the 'patch' terminology stuck.

Nowadays, even switches are obsolete – synthesisers can store large numbers of their settings in memory and these 'programs' can, as we've seen, be selected not only at the touch of a button but by digital messages sent from other MIDI devices. Despite the fact that we've moved into this digital synth era, you will still find program change messages being discussed in terms of patch numbers and the corresponding voice/program combinations being called 'patches'.

One minor irritation you might encounter is the fact that some synth and sequencer manufacturers tend to use program change numbers 1-128 rather than 0-127 (internally, however, values 0-127 are still transmitted). Because of this you may find that you have to add or subtract one from particular sequencer patch values – that is, send a program change 1 command to select the voice which, in your synth manual, is identified as program change 0. Don't worry, this is something that you soon get used to!

Program change messages are extremely useful when creating songs which are to be played using many synths and sound-modules. It is, for instance, quite common to add program change messages into the start of a sequence so that the right voices/programs are selected just prior to a song being played. They are also frequently used to control other types of MIDI units. Digital delay and digital reverb units (gadgets which produce 'echo', repeat and other 'sound enhancing' effects) are nowadays invariably MIDI controlled with different effects usually being selected by sending the unit suitable program change messages. I almost always start my songs using a four beat 'count-in' sequence which contains the program change messages for selecting keyboard synthesiser voices, drum machine characteristics, programs on the delay units, and voices on any number of sound modules. This ensures that the equipment is automatically set up for the right sounds immediately before the song itself starts playing.

Well, that gives you a rough idea of what program change messages are and how they are used. Now comes the rather more difficult job of explaining how these sorts of ideas apply to multi-timbral synthesisers – that is, how the ideas apply to synthesisers which can play using more than one voice at the same time...

MULTI-TIMBRAL

Let's start by making this point: the setting up of a multi-timbral synth is very definitely a function of the synthesiser itself, and is not directly related to any standard MIDI messages as such.

As far as the multi-timbral capabilities are concerned, it is best to imagine that the synthesiser is not just one synthesiser, but several all rolled into one. Treated as separate logical entities it should not be too hard to imagine that each of these imaginary synthesisers could be set up to receive and transmit MIDI data on their own individual MIDI channels, and that each could be set to play using a particular voice or group of voices.

How this is done depends on what synth you've got, but rest assured that it will (almost) always be well-explained in the manual. Take the trouble to read about your particular instrument's multi-timbral facilities and spend time experimenting with them – it is extremely important.

Let's suppose you've set up your synthesiser so that data received on channel 2 is played with a 'violin/string section' voice, data received on channel 3 is played using a bass guitar sound, and channel 4 data gets played using a flute sound. What some synthesisers let you do is take any group of such settings and memorise them in a single program location. Having done that, they will then allow that 'multiple setting' to be associated with a single program change number.

The end result is that you can therefore not only program the multi-channel/multi-timbral characteristics, but you can usually remotely switch between different alternative multi-timbral arrangements by using single program change messages.

THE PROGRAM CHANGE MESSAGE

Status byte — **Data byte**

1100 nnnn — **00000000 - 01111111 (ie 0-127 decimal)**

Channel number (nnnn)

Program change data value (data byte)

This part of the status byte indicates that the message is a program change. (1100)

OTHER SYNTH CONTROLS

There are, of course, a great many other facilities on a keyboard synthesiser: you'll find voice selection and editing controls, volume, tuning (for fine control of the overall pitch of the keyboard), transposition options (you may be able to raise or lower the keyboard by an octave or more). There will be levers or wheels for bending the pitches of notes up or down and controlling modulation (automatic cycling pitch variation) effects. Most of the parameter setting, including the MIDI-oriented options (setting the MIDI channel and so on) will be done in conjunction with an LCD display and a few rows of buttons.

MIDI messages can occur whenever you touch either the keyboard or a control, but although all MIDI messages are standardised, not all synthesisers will either understand or indeed transmit every type of message. To find out exactly what message facilities your keyboard has, the place to look is your synth manual. In it (probably hidden towards the back) you'll find something called a MIDI implementation chart, which will provide a summary of the instrument's facilities.

One particular control, which needs to be mentioned before we carry out any real sequencing experiments, affects the relationship between the synthesiser's internal sound circuitry and the keyboard itself. Nowadays, the keyboard to sound links are not permanent, and in fact many synthesisers provide something called a 'local on/off control' which allows the musician to sever the connection between the keyboard and the sound-producing circuitry altogether. From a logical viewpoint, this arrangement allows the synthesiser to behave like a separate keyboard and sound module. When you play a note with the local control off you won't hear anything. That may not appear to be particularly useful but it is because, despite the fact that no sounds will be heard, the MIDI information corresponding to the keys and controls being used will still be transmitted via the synthesiser's MIDI OUT terminal. This, as you'll soon see, helps make the whole process of selecting and recording various MIDI channels, and having them sound with the right voices on your particular MIDI setup, a piece of cake, and is especially handy when working with a multi-timbral synth.

Here's the basic idea: most sequencers allow you to both re-channelise, and re-transmit, the data coming into the sequencer. The name that various sequencers give this facility tends to vary somewhat – it may be called 'MIDI-Thru', 'Re-channel', 'Echo' or something else but I'll stick to calling it a MIDI-thru/echo facility. This facility may be available either as a gadget-selectable option or as a menu item that has to be selected or specified. Either way, it shouldn't be too difficult to recognise this control from the descriptions provided in the sequencer manual.

The name may vary, but the purpose and use does not. MIDI-thru/echo facilities allow you to send back the MIDI data generated by your keyboard (possibly on an alternative channel). More than that, as you switch channels on the sequencer the incoming MIDI data (that is, the data from your keyboard) will be re-channelised before it is stored, so by using multiple sequencer tracks with the appropriate MIDI-thru/echo settings you can record data for all required MIDI channels without having to adjust the synthesiser's channel/voice controls.

In fact, for multi-track/multi-timbral oriented recording, the best idea is to select a suitable multi-timbral setting, turn the local control off and then leave the synthesiser's parameter setting controls alone. You then use the sequencer controls to convert all incoming (synthesiser-generated) MIDI information to the appropriate MIDI channel data needed to play the chosen voices on your multi-timbral synth!

THE SEQUENCER

A great many sequencers adopt a tape deck-style approach to MIDI record and playback operations. The analogy is a good one because, as mentioned last month, a sequencer is very much like a multi-track tape recorder except that it records digital MIDI messages rather than audio sounds. Products like *Sequencer One, Dr T's KCS, Music X* and so on actually make the analogy very clear – the sequencer display contains buttons for play, record, fast forward, rewind etc, which serve similar purposes to the controls found on a conventional tape recorder.

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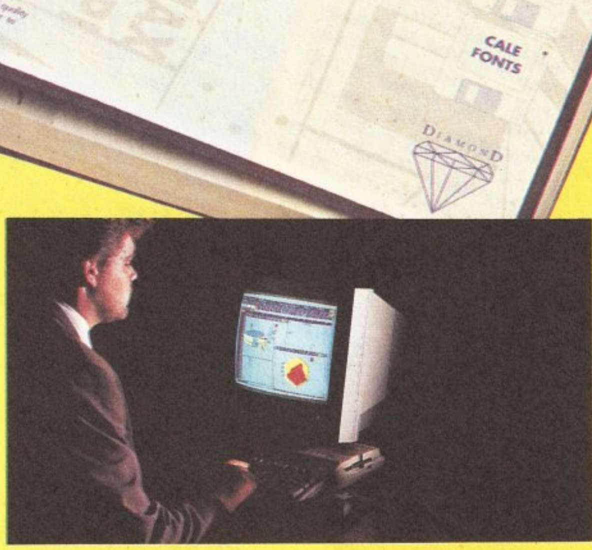
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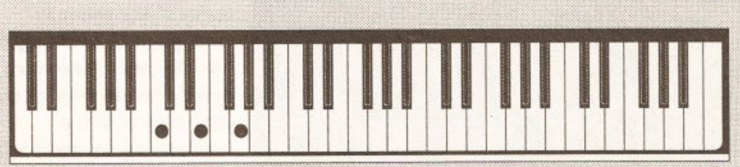
MAKING MUSIC

Read this if you need a few clues about where to start as far as actually playing a tune on a piano-style keyboard is concerned...

Being able to read and write music is not a prerequisite for playing a musical instrument. In fact, some of the world's greatest instrumentalists have established themselves as virtuosos before making any real attempt to learn how to read and write music in the conventional notation sense (the guitarist Django Reinhardt, for instance). Similarly, a large percentage of rock/pop musicians can barely read or write music using conventional notation but many make extremely good music.

This, though, doesn't mean to say that learning a little music theory and learning about notes, harmonies, chord structure and so on is a bad thing – because it isn't. What it does suggest is that there is nothing wrong in developing an 'ear' for music before you try to tackle the more formal side of things. Music, especially in the early stages, should be more fun than hard work!

Most people, even total beginners, when placed in front of a piano-style keyboard will be able to work out how to play something that sounds 'musical'. It may be the first few notes of Three Blind Mice or a few chords (groups of notes played together) that sound good. Just in case you are totally stuck, however, and have no ideas (musically) of where to start here are a few chords shapes and a few tips which should get you on the right road...



A chord of C major (usually written as the chord symbol C)



A chord of F major (usually written as the chord symbol F)



A chord of G major (usually written as the chord symbol G)



A chord of A minor (usually written as the chord symbol Am)



A chord of E minor (usually written as the chord symbol Em)

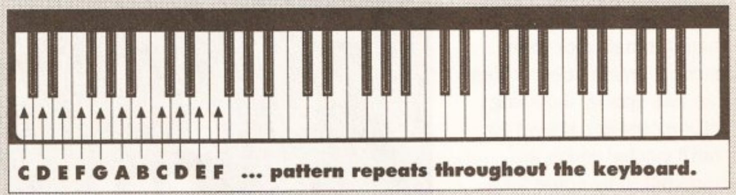
Here's one example to try - it's in what is called 4/4 time, which means that there are four crotchet beats to a bar. Don't worry about what that means – just count the beats in the bar, changing chords with every fourth beat as indicated:

bar	1st	2nd	3rd	4th
beats count	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
chords to play	C / / /	G / / /	Am / / /	Em / / /

You're bound to find many other reasonable-sounding chord combinations if you experiment!

Now, here's a tip for inventing some melodies to go with the chords that you can now play: on the piano-style synthesiser keyboard one musical key is easier to play in than any other. It's called the key of C major, and basically it consists of all of the white notes on the keyboard. The chords mentioned earlier all fit into the key of C quite nicely, so you can use them as 'backing chords' for your melodies.

At this stage it is useful to know what notes are being played, so we need a reference point and since these examples are going to be in the key of C I'll start by showing you where these C notes can be found: look at the black notes on the keyboard and you'll see that they all come in groups of twos and threes. Pick one of the 'two note' groups and look at the leftmost black key. The white note immediately to the left of that black key will be a C note. Moving along the white notes from left to right you'll find the notes D, E, F, G, A, B and then you'll find another C note (again situated immediately to the left of one of those groups of two black notes). This white note pattern is repeated throughout the whole of the keyboard.



Names of the white notes on a piano style keyboard

Why am I telling you all this? It's because in the key of C there are literally hundreds of melodies that you can copy or create which can be played using only the white notes of the keyboard. That makes it very easy for a beginner or non-keyboard player to pick out a tune in the key of C major. The notes E, D, C ... E, D, C for instance are the start of Three Blind Mice. Hopefully you'd want to be a bit more ambitious than that, though!

To play really safe, you could stick to building melody lines that duplicate the notes which you've used in your chords (that way the melody notes will then obviously 'fit in' with the notes of the chord), but it's best if you use that guideline loosely and primarily use your 'ear' as a guide. (There's an unwritten rule in music that goes something like this - if it 'sounds' right it is right!)

Here's a sketch of one chord/melody piece that could be used for the sequencer examples in the main body of this month's text. It doesn't really matter whereabouts you play this on the keyboard, but it'll probably sound best if you play chords around the middle/left of the keyboard and the melody over towards the right (the melody will then have a higher pitch and will stand out more). Play the melody notes (evenly spaced and in time with every other beat of the sequencer's metronome) together with the chords shown underneath...

bar	1st	2nd	3rd	4th
beats count	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
melody notes	E C	B G	C A	B G
chords to play	C / / /	G / / /	Am / / /	Em / / /

bar	5th	6th	7th	8th
beats count	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
melody notes	A F	C G	G F	E D
chords to play	F / / /	C / / /	G / / /	G / / /

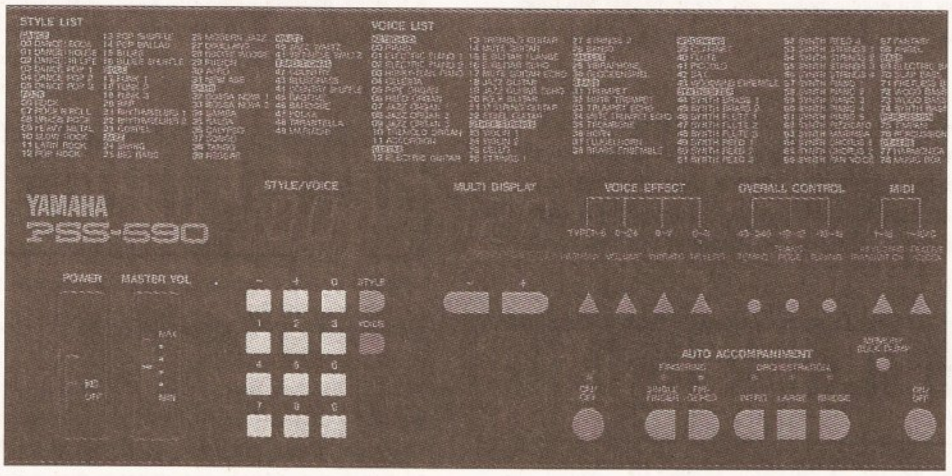
The only way to develop an ear for music is to play, so experiment with your own ideas – and get as much practice as you can!

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As likely as not, your sequencer will load up with a set of default settings available which make initial record/play operations straightforward. There is also likely to be an introductory tutorial in the manual which you should both read and work through. The chances are that this will be quite sufficient to get you started, but in case you do hit problems here are a few general notes that may help...

- One sequencer setting that may need to be checked or altered concerns the clock/timing facilities (sometimes labelled as internal/external sync or some similar term). As I mentioned last month, most sequencers can use either their internal clock as a musical timekeeper, or they can use special incoming MIDI messages known as 'MIDI clocks' which are transmitted by some MIDI devices (such as drum machines). Although some keyboards do have MIDI clock generators on-board, the chances are that your synthesiser will not, so you will need to check and, if not already active, select the 'internal clock' or 'internal sync' options on the sequencer.



Most synthesisers come with a number of preset sounds. These can be selected automatically by a sequencer connected to the MIDI port. Using MIDI several sounds can be played at once.

- If there is a choice of metronome settings you should opt for an ordinary audio output – that is, the option which produces an audible click to help you keep time. You'll know when you've got these settings right because when you hit 'play' you will hear the metronome clicking away and will probably see a bar measure indicator increasing with each click. At this time, you can experiment with the tempo control. By altering the value (which may involve typing in a new value or using the mouse to drag-select a new value) you'll be able to alter the speed at which the sequencer records and plays. The idea here is that you adjust the speed of the metronome until it is the same speed as the music you wish to play.

- It may also be possible to set a 'count in' (that is, choose to have a number of metronome clicks sound before the sequencer starts recording), or have the sequencer start recording automatically the moment you press a note on the keyboard. Similarly, some sequencers offer an auto-loop facility whereby when they get to the end of a certain (user-defined) number of bars they loop back to the beginning and start playing them again (perhaps recording any new data on another track).

INITIAL EXPERIMENTS

Recording itself is no more difficult with a sequencer than with a conventional tape machine. Basically you just set the play/record buttons as directed by your sequencer manual and play your music. When you've finished, just hit the sequencer's stop button!

I've not yet talked about 'MIDI modes' (and I'm not going to until I deal in detail with the MIDI standard in instalment five). Your synthesiser will support, and probably default to, something called Mode 3 (sometimes called Omni-Off/Poly Mode) which allows ordinary channel-specific polyphonic operation. If your synthesiser supports a number of modes then you should opt for Mode 3!

To recap, then, your synthesiser should be in Mode 3, have its local control off and should be set to a suitable multi-timbral program. The sequencer should be set to MIDI-thru/echo so that the synthesiser's MIDI output is both recorded and returned to the synthesiser on one of the MIDI channels designated for the multi-timbral voice elements. You should have one MIDI lead going from the MIDI OUT terminal of the synthesiser to the MIDI IN terminal of the MIDI interface, and another going from the MIDI OUT terminal on the interface to the MIDI IN terminal of the synthesiser. Your Amiga (and possibly the MIDI interface if this needs separate power) should be switched on and you should have loaded your sequencer program.

At this stage you should, even with the local control off, be able to hear the synthesiser making audible sounds when a key is pressed. This is because when you hit a key the sequencer will read the MIDI note-on and note-off messages, re-channelise them and transmit them back out via the MIDI interface's MIDI OUT terminal. Since this will be connected to the synthesiser's MIDI IN connector, the synth's sound circuitry will immediately read those re-channelised messages and play the notes with the voice associated with that particular MIDI channel. The keyboard data is therefore making a synthesiser-to-sequencer-to-synthesiser trip before actually reaching the sound-producing circuitry, but since this is happening very quickly it sounds instantaneous. If you don't believe that the keyboard is still disconnected from the sound circuitry, try unplugging the lead that is going to the MIDI IN of the synthesiser – when you unplug the lead, the synthesiser sounds will stop.

You should also, incidentally, now be able to select and hear different voices by selecting different MIDI-thru/echo channels. This will confirm that your synthesiser MIDI/program controls are correctly set up.

If, for instance, you have set the synth up so that channel 2 is to produce violin/string section sounds, channel 3 to produce piano sounds and channel 4 to produce flute sounds, then as you select MIDI-thru/echo channels of 2, 3 and then 4 (pressing some keys each time), you should hear the three different sounds in turn.

At this point it should just be a matter of adjusting the tempo control to suit the speed of the music you wish to play, selecting a track to record on, and then hitting the record/start control on the sequencer. Do it, and bash out a few chords – as you play in time with the metronome, the sequencer will be recording all of the MIDI messages that are being generated. When you've finished, just hit the sequencer's stop button.

If, using the above-mentioned channel/voice combinations, I'd chosen the violin/string-section channel 2 voice then the notes played would have been recorded as channel 2 data. Use the rewind button (or do whatever else that must be done to get to the start of the recorded sequence), hit the sequencer's 'play' control and you should hear your sequence play automatically.

Now switch to another MIDI-thru/echo channel that corresponds to another of the voices defined in the synthesiser's multi-timbral program. Play a note on the sequencer and you should hear the new voice. So far so good, now hit the play button on the sequencer but this time play along with the track as it replays (perhaps make up a melody to fit the chords you played in the first place). The recorded track should be sounding using the original voice (violin/string section in the case of my example), but the notes sounding while you play along with that track should be heard with the newly selected voice. In terms of the example settings, if I had changed to the channel 4 flute voice I'd now be hearing the recorded data playing with a violin/string section sound with any new notes being played with a flute voice.

Select another sequencer track and repeat the experiment – this time hitting the sequencer record/play buttons before you start. You should again be able to hear the track that you originally recorded as you play but, more importantly, the sequencer will now be recording the notes used as you play along with that existing track. The result? If you stop the sequencer (explicitly rewinding to the beginning of the sequence if this is necessary) and hit the sequencer's play control, you should hear both tracks sounding. (Going back to my multi-timbral example I'd be hearing violin/string section chord sounds with a flute melody playing as well.)

That has produced two tracks, and the process can be repeated many times. If you've set the synthesiser up so that other channels produce other sounds then select a few and experiment. You'll also find that existing tracks can be muted (prevented from playing), so you could mute your last effort, select another track for recording and then try again.

It's once you've actually got to this stage that the power of the sequencer will start to be driven home.

Much more can be done, as you'll see next month when we look at some of the typical editing facilities provided by current sequencers. Next month's issue is on sale on December 5. AS

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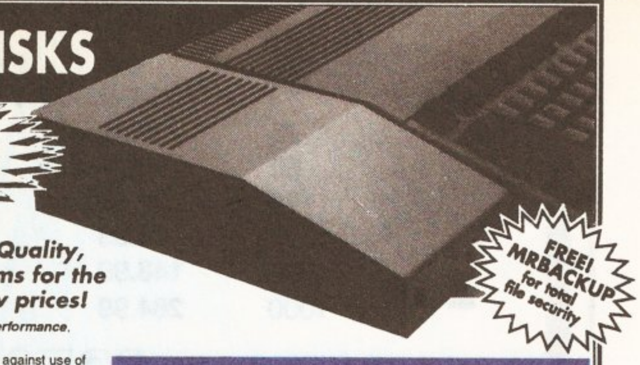
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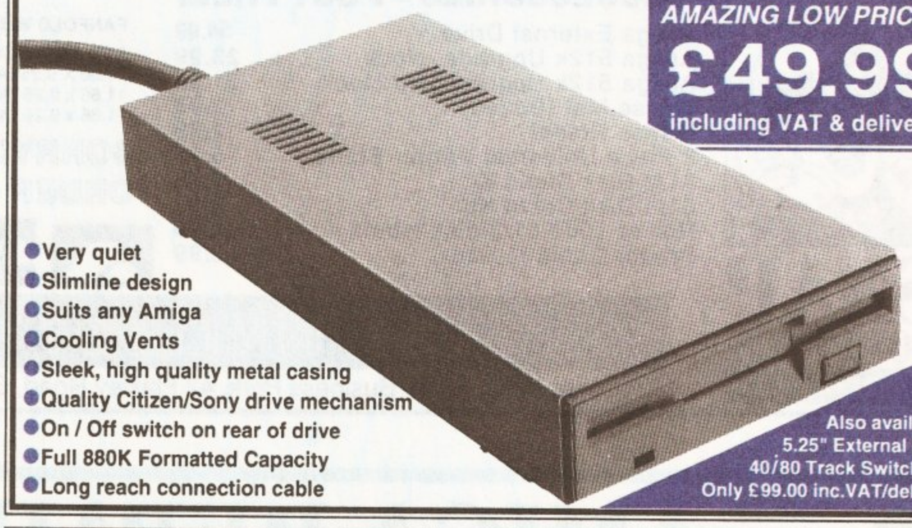
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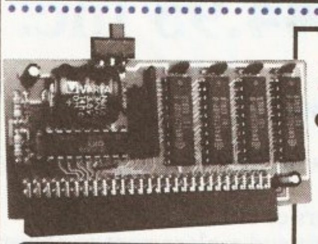


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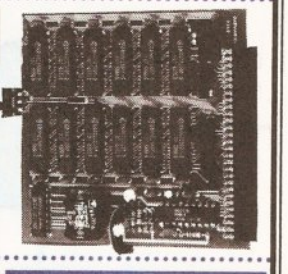
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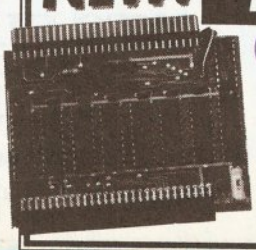
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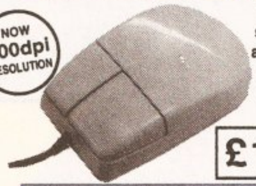
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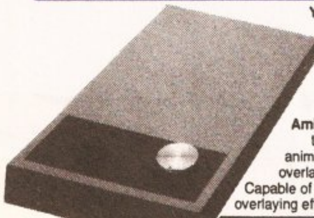


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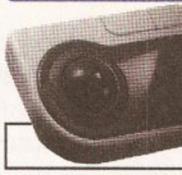
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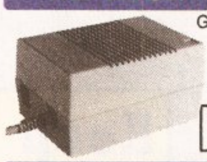
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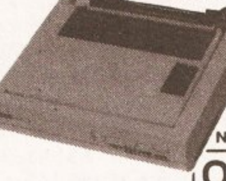


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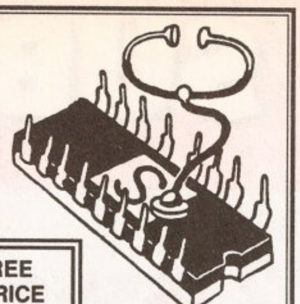
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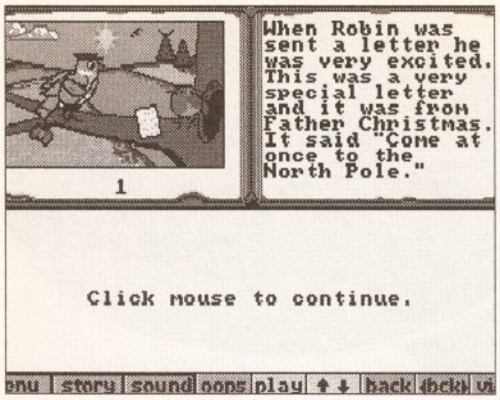
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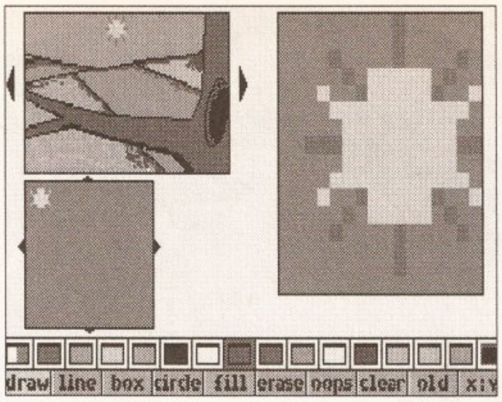
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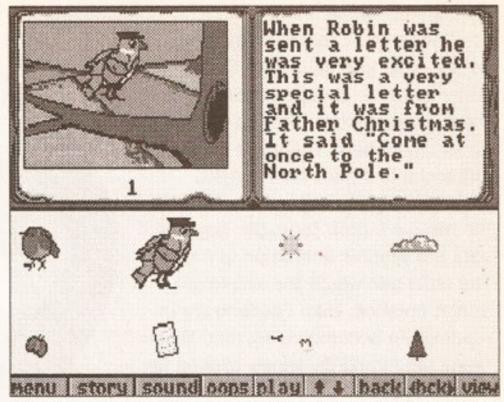
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At its most complex, *Magic Story Book* gives almost complete control over the creation of stories. There's even an element of programming.

School's out

The latest and best educational software reviewed by Pat Winstanley

Reading is probably the most important skill that young children learn. Without it schoolwork in other subjects becomes progressively more difficult to handle. By the time kids hit junior school, a large proportion of their study consists of tackling workbooks. Because children learn at different rates this is an excellent way of ensuring brighter kids aren't bored, while slower ones aren't left behind. The problems come when a child has reading problems.

To work under minimal guidance from a book a child must be able to read the questions posed. If he or she cannot, the topic being tackled will literally be like a closed book. A child who is a whizz at basic concepts (say in maths or science) may find it impossible to progress alone, simply because he or she can't follow the text. And if the child needs to continually approach an adult to have the text read out, concentration may suffer while waiting in the queue for attention.

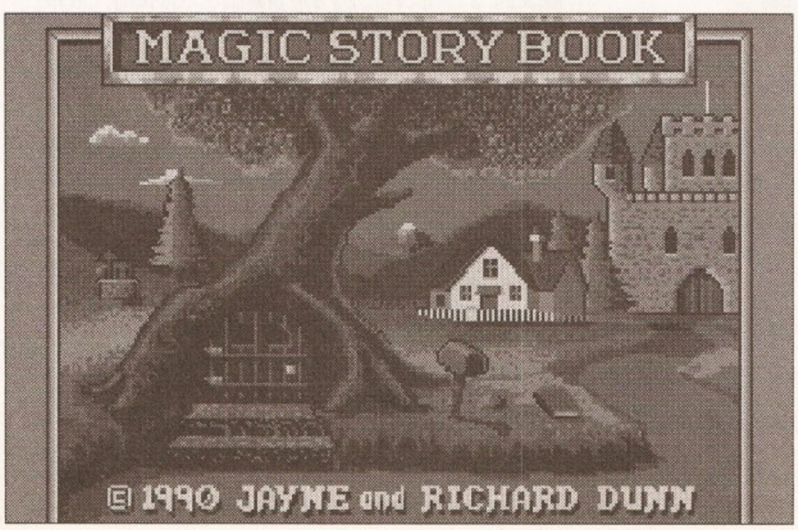
Computer-aided learning is no different in this respect but has the added drawback that children need machine skills too. The best educational programs are ones which match controls and instructions to the level of the program content. It's no use giving lengthy screens of instructions to under-fives who can't read yet! A major bugbear in this respect is the problem of disk protection. Here, producers are caught whichever way they go. Protect the disk so that it can't be copied, and the original disk is likely to be damaged through normal childlike wear and tear.

On the other hand, allow copies to be made and the package is open to piracy unless manual protection is used. But manual protection is difficult for young children to cope with – "type the word on page one, line two, position three" and so on. Juniors can cope with this, but younger children have problems. It seems a shame when even infant school children are perfectly capable of swapping from one game to another after a little tuition on disk-handling and the Vulcan Death Grip (Pressing Ctrl Amiga Amiga simultaneously for a soft reset).

The ratings in this column reflect this factor in "Ease of Use". A good score here shows that a child of the age group for which the educational content is aimed will have little difficulty in operating that game alone (or with minimal help). This implies that on-screen instructions are simple and taken step-by-step with plenty of prompts. Disks should autoboot rather than having to be run from Shell or the Workbench. Long pauses while software is sorting itself out should be punctuated by regular updates on screen so that an impatient child doesn't batter the mouse or keyboard in frustration. Multi-choice packages should not dive back to the menu automatically at the end of a game turn – there's nothing more frustrating than trying to master a section, only to have to reboot that section each time failure occurs. Above all, disks which cannot be copied should NEVER need to be written to (for high score tables and so on). That's just asking for trouble with adults, never mind kids.



"Kids love to play, especially when school's out – but which programs are worth the money? Read on."
Pat Winstanley



***Magic Story Book*, combines reading, writing, drawing and simple programming.**

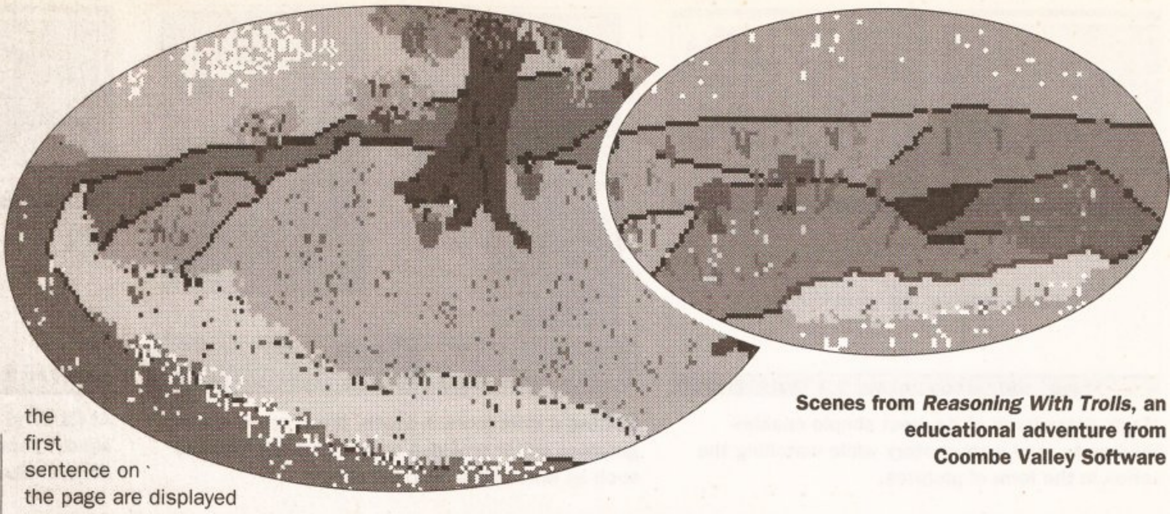
MAGIC STORY BOOK
Pre-school to Adult

This program is one which will delight children of any age together with their parents and teachers. The idea (initially) is to read a scrolling story book with text and background graphics. But there's a lot more to it than that.

Magic Story Book combines reading, creative writing, drawing, graphic design and simple programming in one package. While all these aspects are present, their use is optional. At its simplest, *MSB* allows children to read (or have read to them) a short story while watching animated scenes of the action described. At its most complex the package allows almost complete control of the creation of such stories.

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Scenes from *Reasoning With Trolls*, an educational adventure from Coombe Valley Software

The heart of the package is a screen split into several sections, some of which change according to the mode selected. The top half of the screen shows a graphic on the left and a text area on the right. When simply viewing a story, clicking the mouse button turns the page and sets the graphic animation in motion. The child can watch the animation until it finishes, then concentrate on reading the accompanying text. When ready the mouse is simply clicked for the next page.

After reading through the stories supplied on disk, children want to both modify existing tales and create their own. This is where the great strength and flexibility of the package shows its mettle. Two modes of operation exist, one for under 8s which disables most of the more complex editing facilities, and one for the over 8s which allows full use of the package.

Smaller children will want to play about with sprites first, so in their editing mode a prepared story is displayed, with the correct backdrop in the graphics window with the text alongside. Below this is a selection of sprites which the child can choose by clicking on them. Use the mouse to place the sprite where required and another click drops it on to the picture. All the sprites used for the original page are available, so the child's own version of the story can be composed.

Text too can be edited. For the younger group all the words used in the first sentence on the page are displayed in large type in the lower screen. All the child has to do is click on the required word. This will then be placed in the next available position in the text area. Clicking in the word selection screen with the right button cycles through words used in other sentences. One nice touch here is that words beginning a sentence are automatically capitalised. Another feature is that words are displayed in different colours depending on their function - verbs in red, nouns in blue, adjectives and adverbs in green and anything else in grey. This feature is a great help to children just beginning to construct sentences. For instance they can be told to make sure every sentence has at least one red, one blue and one grey word. The child can then be encouraged to add green words to colour their sentence. Older children have many more words to choose from, and can also type new text directly from the keyboard.

Graphics come in for a similarly comprehensive treatment with both background and sprites available for editing and creation. The built-in graphics editor allows simple drawing features such as line, circle, box and draw while the brush can be used to cut and paste blocks for speed and ease of use. Sprites can also be grabbed for static use in the background. The programmers have thoughtfully provided extra access for AMOS users to load, edit and save whole banks of sprites using AMOS. Sets of sprites are used to produce animation which again can be edited at will using either existing story contents or new creations. Sprites don't have to remain in the same spot but can be made to move about the screen or even do a quick exit, stage right.

A feature which fascinates my children is the use of sampled sound to illustrate stories. As with all the other story components these can be edited and swapped around. Sounds can be played backwards, forwards, looping or sweeping and the effect adds greatly to the impact of a story. It's satisfying to see and hear court musicians lifting their trumpets and blowing a fanfare as the king arrives.

I'd have liked to have written a two/three page review of this alone. It is very complex and has loads of features, while still being accessible to children, parents and teachers as an academically educational resource. In addition, the cross-curricular scope is virtually limitless, and children of all ages can work together without boredom setting in. It also has loads of creative features which cover all basic aspects of Amiga use and programming – a good introduction for technophobic parents and teachers. The programmers have taken the trouble to make the program easily usable with both AMOS (and STOS for those of you who wish to pass the message on to ST owners) in terms of sprite-handling and sound effects.

To be honest – I think *Magic Story Book* is going to knock the socks off the educational software currently available, simply because it is good in concept and polish, and more importantly a relatively un-hackneyed idea presented in an accessible form for both children and adults. The lasting use from a program such as this implies that it will still be alive and in use several years hence since children of all ages and abilities can benefit from it.

LANGUAGES TUTOR

Senior/Adult

Anyone learning a foreign language needs plenty of vocabulary practice, and that's what this PD disk sets out to provide. Four languages are covered, French, German, Spanish

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COMING SOON

FUN SCHOOL 4

The new version of this highly popular series from Europress (0625 859333) should be out as you read this and features revamped images for the old characters. For instance Teddy now wears shades and Reeboks and boasts a skateboard. Three versions will be available – under 5s, 5s-7s and 7s-11s. Each pack will cost £24.99. Full review next issue.

TELLING THE TIME

From Rainbow Educational Software (0392 77369) comes news of the next in their series of budget programs. *Telling the Time* is due for release at £7.99 sometime in November.

SPELLBOUND

Lander Software (previously Scetlander) also has a new offering for November. Deviating slightly from its usually pure educational approach, *Spellbound* is an arcade adventure but still has plenty of educational content with the collection of letters and words central to the plot. Aimed at junior/senior children it combines action with the development of logic, memory, spelling and co-ordination skills. Price £25.99. Ring 041-357 1659 for more details.

COUNT AND ADD

Also from Lander and out as you read is a set of programs aimed at helping young children to count. Shades, a multicoloured dog presents counting, adding and matching games with sampled speech. The program is also said to be suitable for older children or adults with learning difficulties. £25.99



***Count and Add*: learn to count with Shades the dog.**

FRACTION GOBLINS

Educational adventures will be back to the maths theme soon when Coombe Valley Software finishes converting *Fraction Goblins* for the Amiga. Expected to be ready before Christmas the game is intended for older children and will cost £12.00 by mail order – see Shopping List for address.

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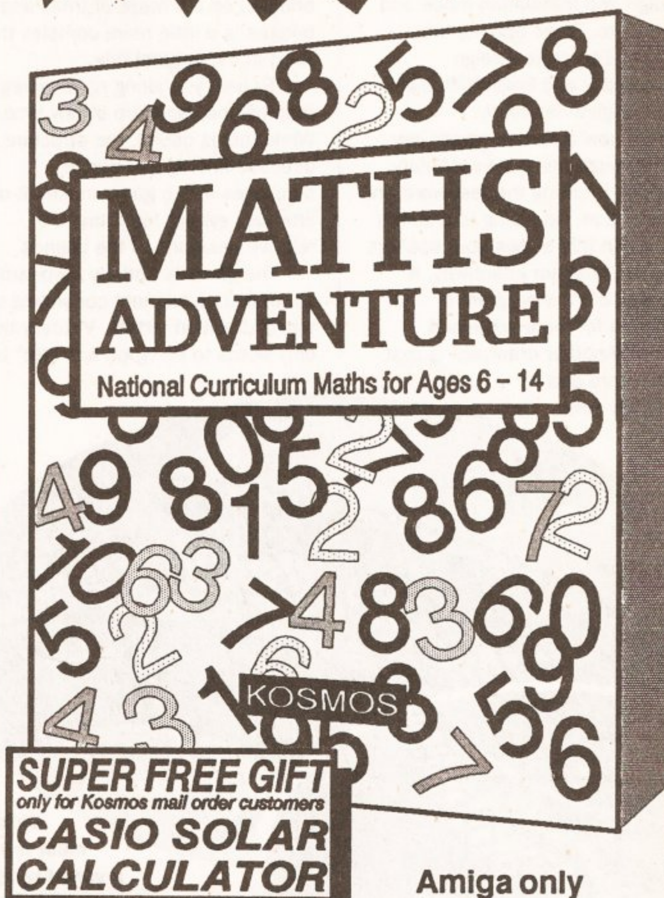
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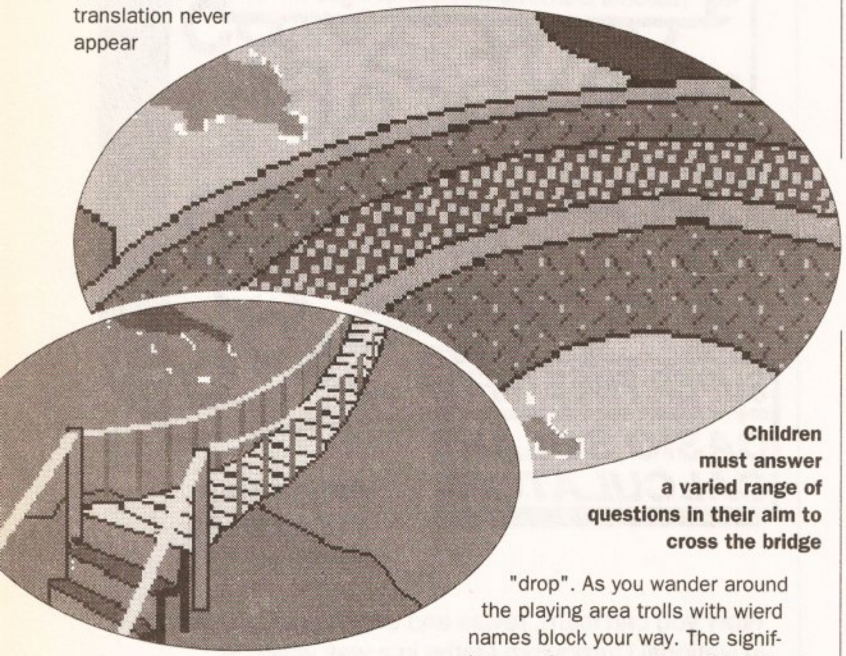
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and Italian with options for translation both to and from English in each.

Operation of the program is very simple, just choose the required language and translation mode and away you go. Three options are available; English to foreign alphabetically and English/foreign, foreign/English randomly.

From now on pressing any key cycles through the test vocabulary, alternately showing the test word and its translation. No typing is required at all. While this allows poor spellers to use the program effectively, it badly restricts the program's usefulness for more advanced students. Another drawback is that the test word and its translation never appear



Children must answer a varied range of questions in their aim to cross the bridge

simultaneously on the screen. While translating from English that doesn't really matter since the student will know the English word well, but it is tremendously useful to leave the foreign test word on screen when working in the opposite direction.

This is a handy disk for anyone who needs to brush up their vocabulary or is simply in the mood for gentle quizzing. While not exactly state-of-the-art, it is a worthwhile acquisition at the price.

REASONING WITH TROLLS

Junior/Senior/Adult

Following last month's adventure theme, Coombe Valley has released another of its conversions to the Amiga. Again, the game follows a text/graphic adventure format, but the puzzle element is very different to those seen in earlier offerings.

This time you play the part of the littlest Billy Goat Gruff (and anyone who says "Who?" has never been exposed to small children)! Small, middle sized and great big Billy Goat Gruffs have wandered off elsewhere so you must brave the bridge trolls alone to reach the other side of the river where the grass is always greener. Unfortunately the river in question is dotted with a variety of islands, each with interconnecting bridges, so the maze of trolls and bridges is a little more complex than seen in the original tale.

To help you along an on-screen map can be called up at any time. While this is useful, the structure of direction-finding and bridge blockages in the game makes it of little use except for noting the relative positions of the islands.

The game is entirely keyboard controlled, movement consisting of typing direction letters. Virtually the only words to be typed are "get" and "drop". As you wander around the playing area trolls with wierd names block your way. The significance of names such as "Con Troll" and "New Troll" are a mystery, but as further progression is made things begin to sink in. Each troll name when said aloud sounds like another word or phrase (control and neutral in the above example). Trolls won't let you cross the bridge unless you pay a Troll Toll in the form of an object previously collected. Unfortunately the trolls won't tell you what they want – you have to work it out by making a link between object descriptions and troll names. From the above example, the objects are a remote control box and a gearstick.

Unlike many adventures where objects are lying around for easy collection, in this game you have to work for them, and that's where the educational angle comes in. To obtain an object you must "bleat" for your Fairy God-Nanny. She's willing to help, but only if you answer some questions. The questions are mainly logic problems. For instance you may be asked to complete a series of numbers, letters or sums. At other times you may be presented with ciphers to solve, scrambled words to identify and correct or perhaps a statement to be judged true or false. The range of types of question keeps interest going – which is just as well since a lot of problems require answering to complete the game. Although there is some repetition of questions, this doesn't detract at all.

Each time you successfully answer some questions the Fairy God-Nanny will drop an object at your feet. As the object is collected a description of it appears on screen. This is the only time you see the description since the normal adventure command "examine" is not implemented. To repeat the description you must drop the object and pick it up again. Objects available can be animate or inanimate and sometimes interact with each other. For instance I was carrying a (live) chicken when the Fairy God-Nanny gave me an insect for answering her questions. Before I had a chance to do anything with the insect the chicken ate it... aaargh!

The problems posed in this game are a welcome change from the repetition of theme which becomes tedious in games covering only one topic (such as maths). In addition a wide range of difficulty levels may be set. These eight levels (from easy peasy to horribly hard) presumably match the 5-12 range covered by the game. But I reckon I'm not the only adult who'll be resorting to paper and pencil to work out the harder ciphers. My seven- and eight-year-olds find the easy peasy level hard too, probably because they are just coming to grips with the logic rather than straight "10X10=?" approach. They both need help to understand how to go about the different types of question, although once the approach, method and reasoning has been explained and understood, the actual calculations and vocabulary involved in appropriate levels are well matched to their ages.

This is definitely a game to challenge any family with junior and senior children, their parents and their grandparents. Highly recommended. AS

RATINGS

	Educational Value	Ease of Use	Flexibility	Addiction	Overall Value
Languages Tutor	4	4	2	2	3
Magic Story Book	4	4	5	4	5
Reasoning with Trolls	5	4	4	3	4

Successful educational programs, especially those intended for children, need to combine fun with learning. A good educational rating combined with addictiveness shows a well-balanced and valuable resource. Other ratings shown here affect the user-friendliness of the product, reflecting the hassle-factor involved. (All marks out of 5.)

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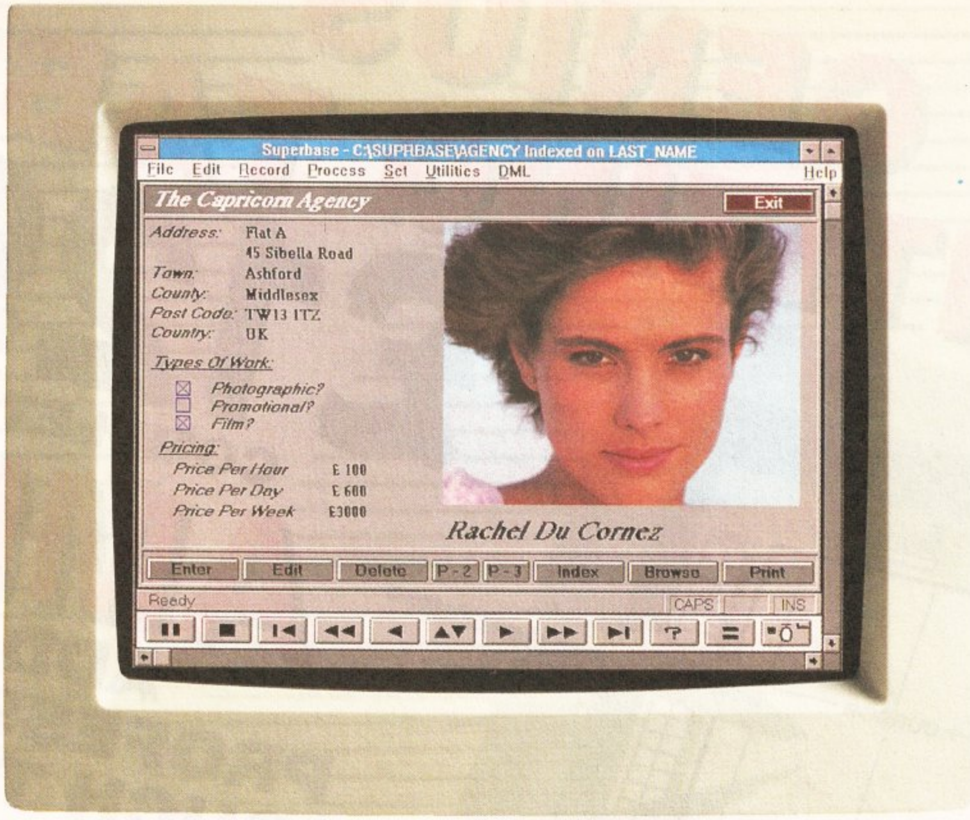
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EDUCATIONAL VALUE

	Maths	Lang	Scien	Reflex	Logic	Revise
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Magic Story Book	Y	Y	Y	N	N	N
Reasoning with Trolls	Y	Y	N	N	Y	N



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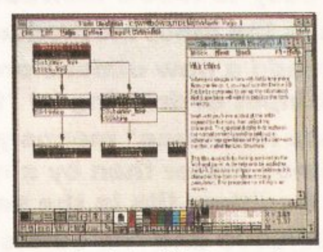
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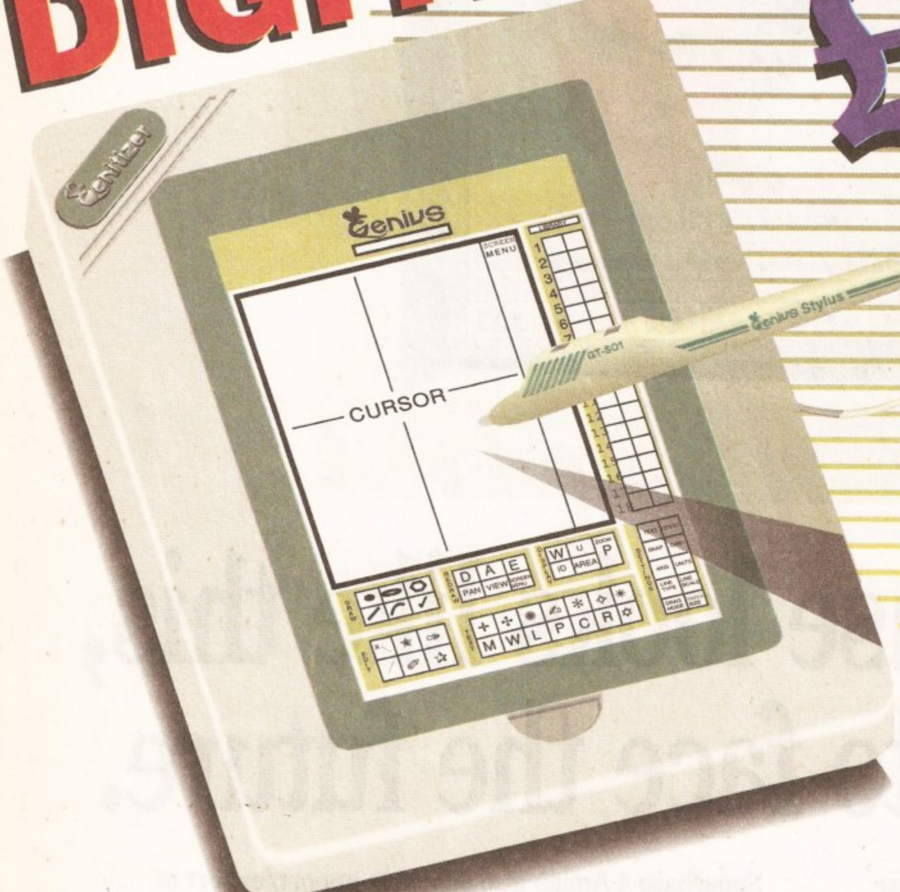
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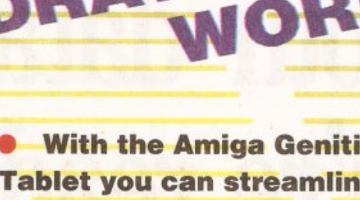
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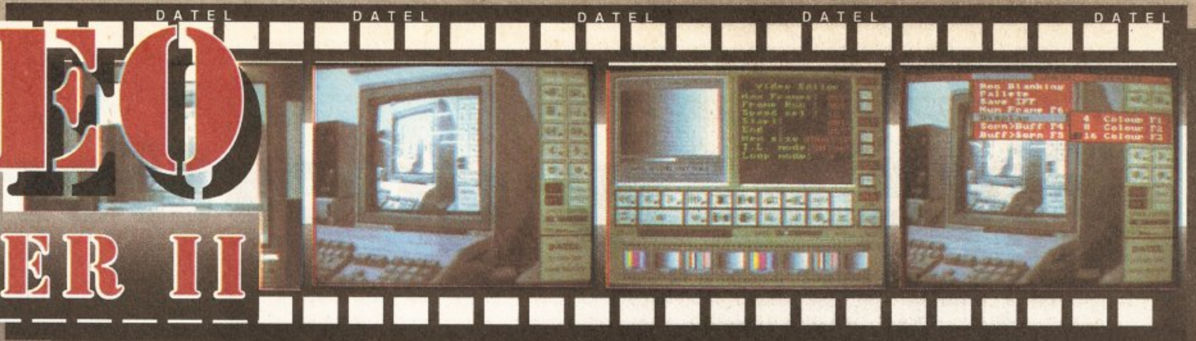
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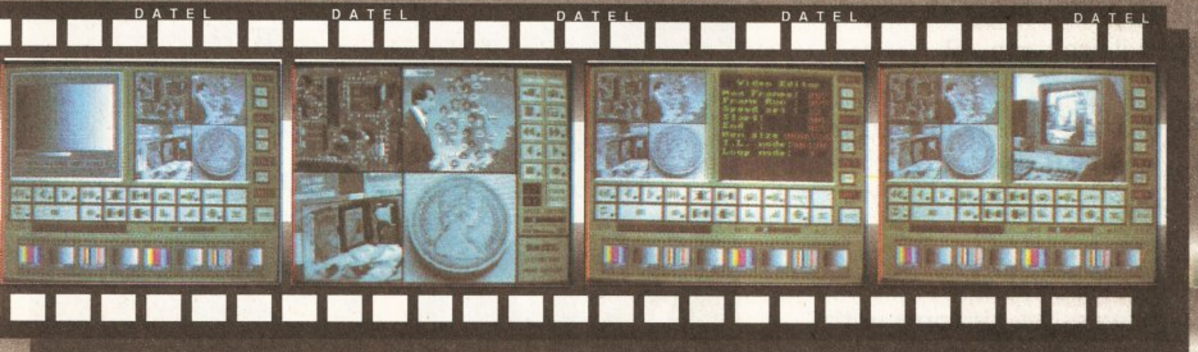
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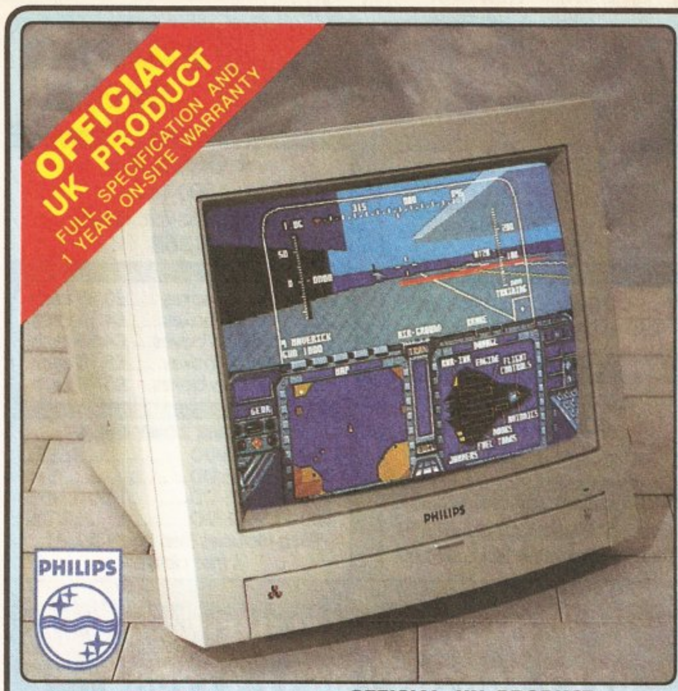
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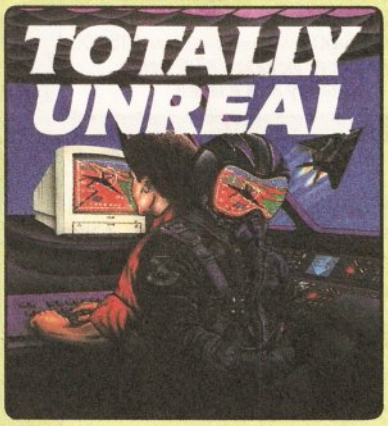
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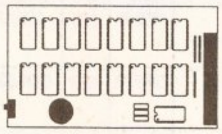
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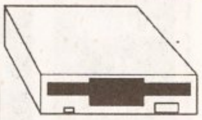
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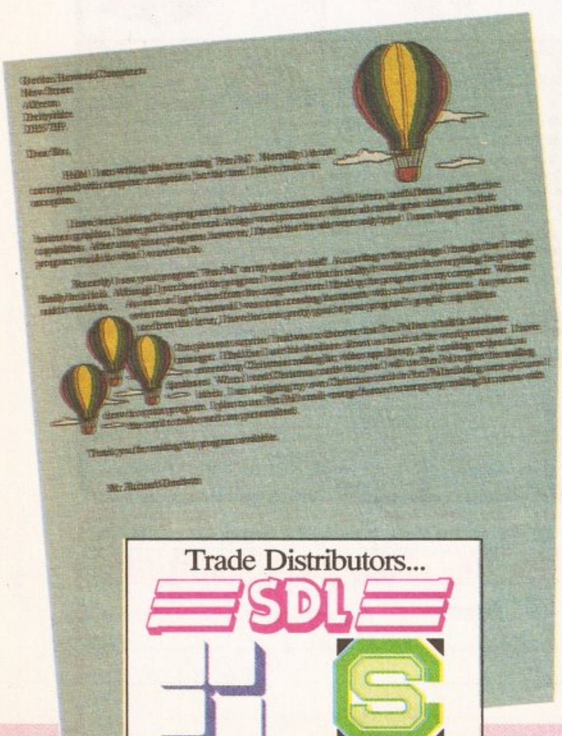
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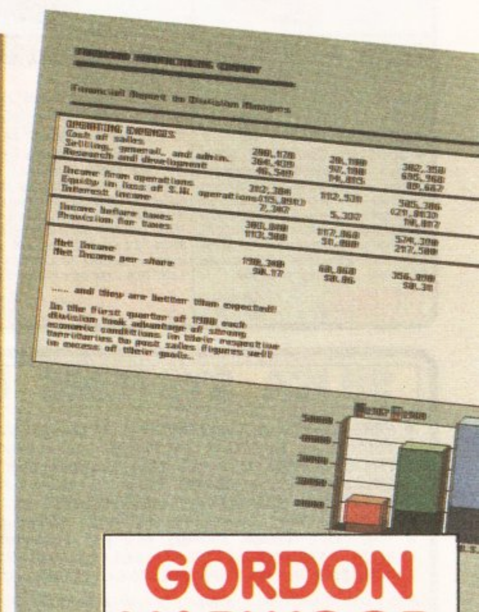
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Spreadsheets

In the first part of a series exploring spreadsheets, Mark Smiddy shows how to produce business graphics the easy way

One of the major uses of spreadsheets is for creating graphs and charts. Now, opening a tutorial on spreadsheets with instructions on charting may seem a little strange, but as I see it this serves two important tasks. First, beginners will receive encouragement by seeing a graphical result of their efforts. Second, those of you who already know the lingo can pick up a few pointers on how to get the best out of charts.

Regular followers of this column will already know that my preferred Amiga spreadsheet is Gold Disk's *Advantage* – because it's fast, suitable for beginners and easy to get results from. This does not necessarily make it the best, however. There are other worthwhile offerings such as *K-Spread 3* from Kuma and Micro Systems Software's *Analyse 2* – as found in *The Works Platinum Edition*. *The Works* is probably the more popular among beginners – although more complex than *Advantage* – so I'll be featuring this one too.

SPREADSHEET BASICS

So much for the intro, now for some basic principles. If you are already familiar with the basic workings of your chosen sheet, you can skip this part and continue with Chart Basics which follows.

In essence, every spreadsheet – from the most humble to the most advanced – is the same. It's a 'sheet' made up of a series of columns and rows. Everywhere a column crosses a row, an imaginary box – a cell – is formed. The whole thing is collectively called a cell matrix.

Traditionally, the rows are numbered and the columns are lettered – so every cell has a unique address derived from the intersecting row and column headings. Therefore the first cell in every spreadsheet (sometimes called the home cell) has the address A1. The next cell to the right is B1; the cell below is A2; and the cell diagonally below and to the left of home is B2. When a 'range' (a block of cells) is selected, the current cell is the one in the top left of the range. The diagram below shows some of these ideas in detail.

Each cell is an empty container waiting to be filled. For most applications the cell matrix can be thought of as a lot of tiny computers – all linked, but each capable of independent calculations.

There are a few other points worth mentioning at this stage:

- Most spreadsheets have manual and automatic re-calculation modes. In automatic mode all the calculations on the sheet are performed every time you make a change. In manual mode, you must tell the spreadsheet when to re-calculate. Beginners should set their sheets to automatic until they get used to the principles involved. Although this is a slower option, especially for large sheets with a lot of complex references and floating-point calculations, it ensures accuracy at all times.

- Learn how your spreadsheet differs from the ones covered in this article. Spreadsheets tend to follow the same rules, but each has its own idiosyncrasies. For instance, functions in *Advantage* are prefixed with an equals (=) sign, whereas in *Analyse* the @ (at) symbol is used. It is most likely that your spreadsheet will follow one of these conventions, but it may not. This also applies to the spelling of function names. Square root may be spelt SQR() or SQRT() – it all depends on the spreadsheet.

- Experiment with your spreadsheet and explore basic functions such as cursor movement. For instance, pressing [Return] may take the cursor down a row; across to the next column; even backwards in either direction. Also, the cursor keys might double as [Return] keys – entering data and moving the cell cursor.



"Lots of people rave over them – few like using them. But once mastered, a spreadsheet is a powerful tool waiting to be enjoyed."

Mark Smiddy

CHART BASICS

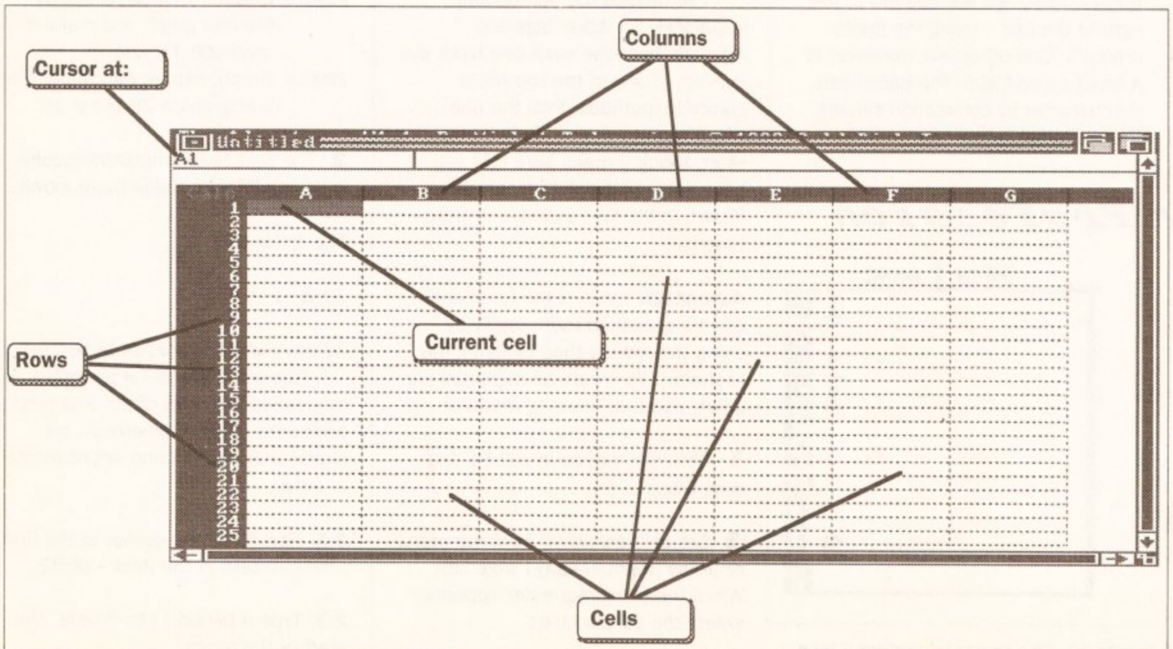
Charts, graphics, presentation graphics – call them what you will – are an easy way of presenting information in a form that people can understand. There are many to choose from, and each has its own applications. But before launching into some deep discussion on the pros and cons of charting, there is a more basic level to consider – the data.

Spreadsheet data is laid out as figures on a grid – but getting the right data out in a predictable fashion is not always as easy as it may first appear. In a nutshell, the problem is this: not all spreadsheets follow the same rules for selecting chart data. There are two schools of thought:

- Let the users select a range and get the application to do the work of selecting labels and so on. This user-friendly but potentially restrictive method is used by *Advantage*.

- Force the users to define all the data ranges, label ranges and so on, themselves. Although more powerful, this system is more prone to error and much more fiddly when you just want a quick chart. This method is favoured by *Analyse*.

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An empty worksheet in *Advantage*. Note that the 'grid' and 'solid fill' options have been turned on for clarity.

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ENTERING DATA

Probably the most basic chart possible is a pie chart. These are different from almost all other charts in that data is not represented on an XY or XYZ (cartesian) grid. Instead, the pie – a circle – is divided into two or more segments where the size of each (as a percentage of the whole) defines the magnitude of each data element. In all spreadsheet charting, every cell in a selected range will be one data element.

It is only possible to represent one data set on each pie chart – and provided you keep this in mind, you should experience little difficulty using them. However, the Amiga's limited display means that few sheets will be able to clearly display more than about ten slices in one graph.

Enough of the theory, now for a practical example. In the Beer Test (*Amiga Shopper* issues 6 and 7), data was retrieved by a series of reports programs. One of these shows the number of respondents (all sexes) in each of five age groups, and this is the sort of data which lends itself to pie charts. The raw results look like this:

Age	**Responding**
18-24	**9**
25-34	**28**
35-44	**32**
45-54	**56**
55+	**48**
All groups	**173**

This can be entered into any spreadsheet so it looks as shown in Data Layout above right.

The layout of the data does not affect the spreadsheet – but the labels for this data set present their own problems. Notice how the headlines for each age group could be viewed as calculations? In fact, most spreadsheets will interpret them as just that and enter the result. For instance, 18-24 entered

Data Layout

The age/respondents data can be entered into a spreadsheet so that it looks like this:

	A	B
1	Age group	Number
2	18-24	9
3	25-34	28
4	35-44	32
5	45-54	56
6	55+	48

or like this:

	A	B	C	D	E	F
1	Age group	18-24	25-34	35-44	45-54	55 or over
2	Number	9	28	32	56	4

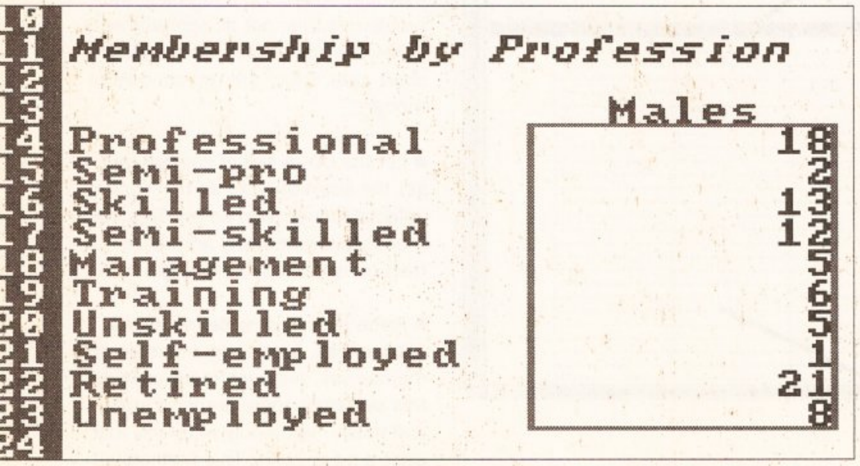
directly would place -6 into B1 – try it! This is quite deliberate, and can be useful when you want to enter the results of quick calculations.

To override this facility, you must enter a special character which instructs the sheet that the following items must be entered as literal text. Most sheets use the apostrophe (') to do this, so you would enter:

'18-24

Note that the apostrophe symbol also introduces 'left-justified' text. That means that the text is placed against the left wall of the cell. Note that if the text exceeds the width of the cell, it will spill over its neighbours. In the first example in Data Layout, the text headings are centered within the cells – which is achieved using caret (^) character instead of the apostrophe.

Similarly, in the other example the row headings are pushed to the right of the cell – using the quote mark ("). One other text formatter is a bit of an odd bod. The backslash (\) character by convention causes the character following it to be repeated across the screen – it is used to separate unrelated sets of data. In *Advantage*, backslash works for the current screen, but in *Analyse* it only works across the width of the current cell. You should note that these features only work for text – numbers are a whole new ball game.



Selecting a range ready for charting (*Advantage*). The range is enclosed by a box. This data is most suited to a pie chart.

SLICES OF PIE

Now that we have some data, we can draw a graph. Just five items of data might sound a little less than miraculous, but the chart it produces can be invaluable to decision-makers. More to the point, it's much faster to read than the raw data. We are now going to produce a chart based on this data with the smallest segment exploded (pulled away from the rest) to highlight it. It is possible to program some spreadsheets to explode the required segment(s) automatically, but we'll use the manual method here.

I've divided the instructions separately for *Advantage* and *Analyse*, because each one uses a version of one of the two most common methods. Pick the one which applies to you. Before you start, though, make sure that you have entered the data by row – as shown in the first example in Data Layout.

***Advantage*:** most of the functions can be accessed more easily by using the mouse than by using the keyboard. To create an exploded pie chart, use the following method:

1 Click the mouse in cell B1 and drag a box to B6.

2 Select 'New chart' from the menu or press [Right-Amiga]-T together. When the chart requester appears, select the 2D pie chart.

3 Click on the 'Explode fifth' button.

4 Enter some text for the heading and sub-heading if you desire.

5 Click 'Continue' and a rather odd-looking pie chart appears. This is because the data is being selected by column and the automatic chart parser is getting confused.

6 Now select 'Data by row' or press [Right-Amiga]-4, and there you have it. I could have set this example up differently (ordered by row) and had the chart drawn perfectly first time, but approaching the problem this way will help you to become more adept at handling these sometimes confusing results.

Analyse: this is more like the PC spreadsheet Lotus 1-2-3 in its implementation, in that you have a choice of menu commands, or 'slash commands'. Many functions, such as selecting ranges, also support the mouse. I'll demonstrate using the slash commands, since they're faster once mastered. Nevertheless, the breakdowns of the slash commands are reflected closely in the pull-down menus. Use whichever method you prefer. (You can even combine the menu, mouse and keyboard commands – this is often quicker too).

1 Enter the following combinations of letters, pressing one at a time:

```
/GN1
/GMP
```

Notice how the menus across the top of the screen appear when you press slash (/) and cycle through as you press each letter. Here's what the codes you just entered mean:

`/GN1` – Graph; Number; 1. Select the first graph and make it available for use.
`/GMP` – Graph; Model; Pie. Make the first graph a 2D pie chart.

2 The next few commands require input, so I'll take these more slowly.

2.1 Enter this:

```
/GDA
```

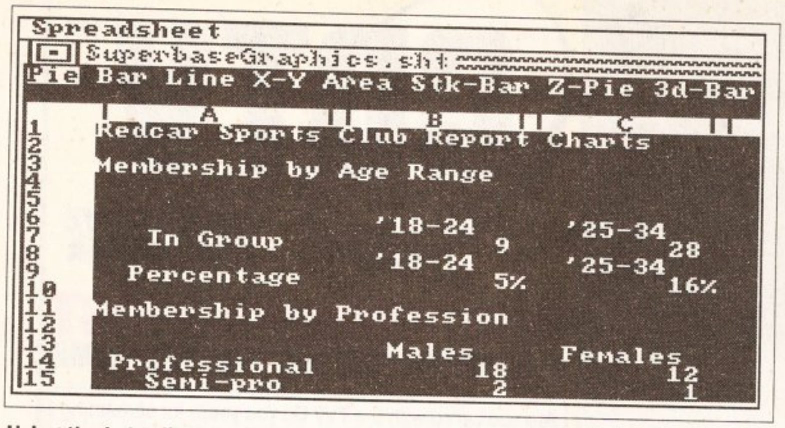
(Which means Graph; Data set; A.)

This will leave you a prompt requesting the start of the first (and only) data range. Remember, pie charts only contain one set of points or data.

2.2 Now move the cursor to the first element (cell) in the data – at B2.

2.3 Type a period (.) to 'freeze' the start of the range.

continued on page 142



Using the Lotus-like chart requester in *The Works Platinum's Analyse* spreadsheet module.

Pie Chart Data

	A	B	C
1	Age group	Number	Explode
2	18-24	9	0
3	25-34	28	0
4	35-44	32	0
5	45-54	56	1
6	55+	48	0

To make *Analyse* explode a segment of a pie chart, you must add another row of data.

continued from page 140

2.4 Move the cursor to the end of the data set at B6 (the selected range should become highlighted) and press [Return].
(Note that steps 2.2 to 2.4 can be performed by dragging with the mouse.)

3 The next step is to define the label range *(Advantage* and some others do this for you). Enter this:

```
/G2LA
```

This is short for Graph; Label; data set A. This prompts for a range, so using the technique described above, select cells A2 to A6. This function is used to add meaningful labels to the pie segments. Without some form of legend or key, the chart is all but useless.

4 You can now (optionally) add a title and sub-heading to the graph using the following commands:

```
/GTF
/GTS
```

(/GTF – Graph; Title; First
/GTS – Graph; Title; Second)

5 The graph is now ready to view using the following command:

```
/GV
```

6 Something's missing. The largest segment should be exploded. It's important to realise that spreadsheets like *Analyse* support several independent data ranges. Whereas the data in *Advantage* is selected automatically, each data set in *Analyse* must be selected separately.

Advantage can explode charts from a requester – leaving the user with ultimate control. As you'll see later, though, this leaves room for error – if the data changes, the wrong segment may be exploded. For now though, you must enter another set of data to the right of the existing set. The completed sheet will look something like Pie Chart Data, above.

Any non-zero number in column 'C' will cause the segment in the columns to the left of it to explode. Here, I've manually flagged the segment by placing '1' in cell C5 and a '0' in the others.

7 All that remains is to tell *Analyse* about the exploding chart data. To do this we need to add a second data set, and this is performed exactly as it was for Step 3 with two minor alterations:

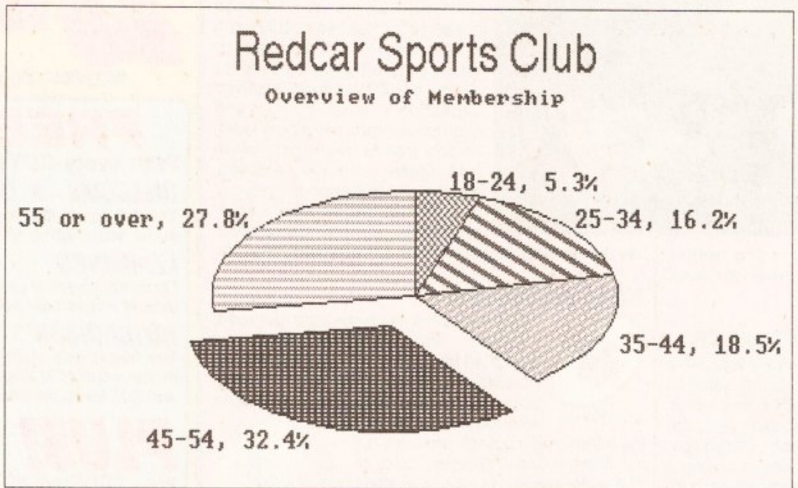
- The data set is 'B', not 'A' as before. (Data set A is holding the actual figures.)
- The range to be selected is C2 to C6, not B2 to B6 as before.

Tip: By selecting the chart data, all non-zero segments are made exploding – a simple way to make the whole chart explode.

Two commands initiate the final sequence:

```
/GDB
/GV
```

(/GDB – Graph; Data set; B
/GV – Graph; View.)



"One I prepared earlier". The pie chart presented in *Advantage*

HOMEWORK

In this feature I have described just the basic functions surrounding one type of chart in two spreadsheets. There's a lot more. Until next time you could try experimenting with the different options and charts available. However, you should note that some charts – HiLo, X-Y and so on – require more than one data set, so the example data supplied will not work. I'll cover these types of chart in more detail in a later instalment. Until then, if you'd like to see any aspect of business computing covered, write to me at *Amiga Shopper* and I'll do my best to accommodate. AS

You can send your suggestions to Amiga Shopper Business, 30 Monmouth Street, Bath BA1 2BW, or e-mail them to amshopper @ CIX or Smidoid @ CIX.

What Spreadsheets are Available

	Price	Supplier	Notes
Superplan	£80	Precision Software	Powerful but slow
Analyse	£50	HB Marketing	Cheap and easy!
Maxiplan 500	NA	Commodore	Powerful if bugged
Advantage 1.1	£100	HB Marketing	Highly acclaimed
K-Spread 3	£70	Kuma	GEM lookalike
K-Spread 4	£100	Kuma	Powerful but ugly

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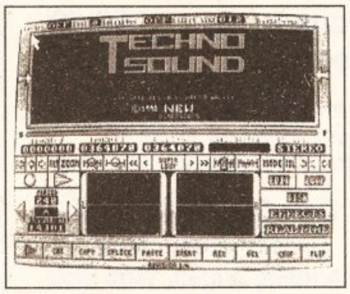
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Write truthfully

This month, Cliff Ramshaw, our polyglot of the processing world, takes a peek at Prolog and finds that it's the logical choice, Captain

My first sighting of a computer was a TRS-80 in the window of a Tandy's store. Looking at the keyboard, I thought that using it was a matter of typing in questions and reading the answers from the screen. When I later got a ZX80, I realised that this was sadly not the case, and that an awful lot of programming had to be done before the damned thing would do anything.

Creating a program capable of understanding a language such as English is one of the primary goals of artificial intelligence (AI) research. Whether or not such a system would be intelligent is still a debatable point, but I would hesitate to describe a machine capable of understanding English as stupid.

Prolog does not understand English. In this respect it is the same as all programming languages, obeying a small and completely defined set of rules, incapable of ambiguity or metaphor. Nevertheless, it has been used extensively in AI research. It was the language chosen by the Japanese for their Fifth Generation project in the eighties, and it is used extensively at Edinburgh University.

The fundamental components of a Prolog system are a database containing previously declared rules and facts, and an interpreter which attempts to answer questions, posed by the user, by reference to the database. Although neither the facts nor the questions are in English, the beginnings of person-machine communication seem close.

In fact, most Prolog applications are restricted to a more conservative branch of AI: expert systems. Such systems are not intelligent, they merely provide a large body of specialised information (previously entered by an expert) and a means of accessing it.

Two questions arise from this: how is the information presented to the database, and how does the user access it? Read on...

Conventional languages are termed 'procedural', because writing a program involves describing the procedure the computer is to follow to solve the problem. Prolog, on the other hand, is a declarative language – the programmer merely declares what is logically true about the situation that is being modelled.

Truths are expressed as relations. Suppose that we wished to represent a collection of books, all written by Tolstoy. We might set up a relation called '`isbytolstoy`'. The relation would be true of any books by Tolstoy, false otherwise. First we have to tell the computer in which instances the relation is true:

```
isbytolstoy(war_and_peace).
isbytolstoy(anna_karenin).
```

Note that both relations end with full stops. Full stops act as terminators for Prolog relations and queries. Having entered the relations into the database, we can proceed to query it. We might ask:

```
isbytolstoy.↵
(anna_karenin).
```

and we would be given the reply 'yes'. If, however, we asked:

```
isbytolstoy.↵
(the_raid).
```

the reply would be 'no', even though Tolstoy did write it. The Prolog system only knows what it is told – there is nothing magical about it.

> **Creating a program capable of understanding a language such as English is one of the primary goals of artificial intelligence research.**

The parameters in this example are not variables – they don't store anything. They are 'atoms', fundamental units, roughly equivalent to string constants in languages such as C, except that the name *is* the constant, as opposed to being a reference to a constant value.

It is possible to define relations that deal with numbers, and to use variables. A relation deciding whether a number is negative would be:

```
isnegative(X):-
integer(X),
X<0.
```

X is a variable parameter. Like all variables in Prolog, it begins with a capital letter. This relation is more complex than the last because it involves a decision process. The symbol ':-' represents 'if', so the **isnegative** relation is only true for X if the conditions following it are true. These two conditions are joined by a comma, which represents a logical AND. The first is '`integer`', which will be true if the parameter it is given is an integer. The second will be true if the value of the variable X is less than zero.

This is fine for expressing simple statements of truth and falsity, but a program needs to be able to do more. Programs usually require operations to be performed on input data. In Prolog, all that is described is the set of logical truths that apply to the operations.

For example, we might want to know which of two numbers is the largest. This relation could be called '`maximum`'. It would take two numbers, and return one as its result – a total of three parameters. There are two parts to the problem: something which is true before the maximum has been found, and something which is true afterwards. Let's say that beforehand the two numbers (X and Y, say) must be integers. After, we know that the result, R, must be equal to either of these integers. We also know that if R equals X, then it must be either greater than or equal to Y. Similarly, if R equals Y, then it must be greater than or equal to X. The whole thing would be written as:

```
maximum(X,Y,R):-
    pre_maximum(X,Y),
    post_maximum(X,Y,R).

pre_maximum(X,Y):-
integer(X),integer(Y).

post_maximum(X,Y,R):-
    (R=X;R=Y),
    R>=X,
    R>=Y.
```

Here, **maximum** has been defined in terms of two sub-relations, **pre** and **post_maximum**. Its parameters are X, Y and R – three variables. R is the result, the maximum of X and Y. For the relation to be true, both **pre_maximum** AND **post_maximum** must also be true. This is expressed with the ':-' symbol, meaning 'if', and the comma, which represents a logical AND.

Pre_maximum is true so long as both X AND Y are integers.

Post_maximum is true if R equals X or R equals Y (the semi-colon represents a logical OR) AND R is greater than or equal to both X AND Y.



"If you're interested in experimenting with languages, the public domain has a surprising number of unusual flavours to try. Prolog is one."
Cliff Ramshaw

In a Prolog system, this program would be written with an editor, saved as a file, and then read into Prolog's database with the '**consult.**' command. A query would be expressed as:

```
maximum(5,12,R).
```

R is said to be an uninstantiated variable – initially it has no value. The Prolog interpreter looks for the **maximum** relation in the database. Having found it, it assigns a value to R (instantiates R) such that **maximum** becomes true. According to the logic of **post_maximum**, R can only be equal to X or Y. The interpreter sets R to 5 (the value of X), and attempts to 'satisfy' the rest of the logic of the relationship. This fails, because 5 is not greater than or equal to 12. The interpreter then tries again with a value of 12 (Y) for R. The **post_maximum** relation is then true, as is the overall relation, maximum.

The value of the variable will be printed out (as would any other variables which the interpreter instantiates in complex examples), and 'yes' will be printed, showing

continued on page 148

continued from page 147

that the relation was true.

Another possible query would be:

```
maximum(1,2,3).
```

The reply would be 'no', since 3 is not the maximum of 1 and 2. Because R was already instantiated to 3, its value would not be printed.

As this example shows, relations can be dependent on other relations. It is possible to make a relation dependant upon itself, ie a recursive relation. The classic demonstration of this is the factorial function...

Factorial is normally defined only for positive integers. The factorial of a number is the result of multiplying together all integers lying between one and itself. So, fac(3)=3*2*1=6. The factorial of zero is defined to be equal to one.

To express this in Prolog we need two variables, one to hold the original number and one the result. Firstly, we must express the relation between zero and its factorial:

```
factorial(0,1).
```

Dealing with numbers larger than zero is a little more complex. Firstly, we must check that the number (N, say) is greater than zero. Also, if R is the result of the factorial, it is true to say that 'R=N*factorial(N-1)'. This is expressed as:

```
factorial(N,R):-
    N>0,
    N1 is N-1,
    factorial(N1,R1),
    R is N*R1.
```

The '**is**' performs arithmetic, in this case setting the new variable N1 to N minus one and setting R to N multiplied by R1. It is always true. Notice that when the **factorial** relation is called again, the variable R1 is uninstantiated. The names are local, so that in factorial's second invocation, the variables N1 and R1 are referred to by the symbols N and R, which are independent of the variables used in the original call. The **factorial** relation is continuously called until **factorial(0,1)** is found to apply.

In the latter case, R1 is set to a value of 1, and control returns to the point after factorial is called, where R is set to N*R1 = 2*1. Control will continue to jump back up each of the levels of recursion, multiplying R1 by the relevant value of N each time, until the top level is reached and a final value for R is found.

Although Prolog is a declarative language, there is a procedural element too. In the above example, R is not set to N*R1 until the previous parts of the relation have been satisfied.

This concession to proceduralism is necessary, particularly in the facilitation of input and output. Programs typically take input, do work on it, and produce output. It is nonsensical to work on data before it is input, likewise outputting data before the results are known. Some element of ordering according to time is needed, and this is achieved by spatial ordering in the program file: the interpreter executes what it comes across first, from top to bottom, left to right.

One of the fundamental structures of a procedural program is the iterative loop. This is achieved in Prolog by means of the 'repeat' predicate. Its use is best illustrated by an example query:

```
repeat,
read(Var),
write(Var),
Var=end.
```

The whole process repeats until the value input by the user for Var is equal to the atom 'end'.

As well as integers, floating point numbers and atoms, Prolog variables can hold more complex data types, implemented in terms of lists.

As suggested by the name, a list is an ordered list of simpler elements, rather like a more general form of array. These elements can be simple variable types, or can themselves be lists. A typical list of integers is:

```
[1,2,6,7,5,9]
```

For processing purposes, a list can be split into a head and a tail. The head is the first element of the list, and the tail is the rest of the list – a list in its own right. In our example, the head is '1', an integer, and the tail is [2,6,7,5,9]. The two can be distinguished in Prolog by means of the vertical bar '|'. A program to take a list and return the nth element of a list is shown below:

```
nthmember(1,H,[H|_]).
nthmember(N,E,[H|T]):-
    (nthmember(M,E,T)),
    N is M+1.
```

It's a recursive program, with the base case being that the first element of the list is the one of interest. The program divides the list into its head and tail, and assigns the first part to the variable H. The underscore character represents a variable who's name is insignificant, in this case the list's tail. The first parameter of the relation is the number of the element of interest, the second is the value of that element, and the third is the list itself. In the base case, the element of interest is the first, so the second parameter must of necessity be equal to the head of the list.

In the recursive case, **nthmember** is called again, but with a decremented first parameter. Similarly, only the tail of the list is passed on. What is happening is that the list is repeatedly being stripped of its front character and N being decremented by one, until N finally becomes equal to one. At this point, the head of the list must be the element of interest, and its value is used to instantiate the variable E.

Lists are an extremely important data structure. They are frequently used as the building blocks for more complex structures such as trees, and are in fact used internally in the Amiga's operating system.

Prolog, on the Amiga at least, is anything but fast. There is no graphic support, and nothing but the most rudimentary file and terminal Input/Output. Given this, and the fact that a Prolog program will not run on an Amiga without the Prolog system itself installed, it becomes clear that Prolog isn't the language to use for developing applications. Neither could it be recommended to the beginner who wants to learn how to program.

It *is*, however, a fascinating language, because it is so unique. Learning Prolog is an educational experience, forcing the programmer to analyse and solve problems in a new way, and introducing many opportunities for experimentation.

Although it may be difficult to believe from this brief outline, it is possible to use Prolog to solve complex problems. Much of the Amiga Prolog system itself was written in Prolog. There are some programming problems that Prolog is particularly suited to solving, such as the logic puzzles found in puzzle magazines. And there is always the dream of programming the Amiga so that it's possible to carry out a conversation with it... AS

PROLOG ON THE AMIGA

There is only one version of Prolog available for the Amiga. It is in the public domain on Fish disks 140 and 141, and is an Amiga port of a Unix-based system developed by the Logic Programming Group at SUNY, Stony Brook. As with nearly all PD languages, it works exclusively from the Shell: installation is not for the faint-hearted.

Documentation comes in the form of a text file. Most of this is taken up with descriptions of the peculiarities of the Stony Brook system and implementation details for use by the more adventurous programmer. A detailed knowledge of Prolog is assumed, so a good book on the language is essential.

The core of the system is a virtual machine interpreter written in C. This is a software simulation of a computer – it takes very simple instructions and interprets them as if it was a microprocessor dealing with machine code. The rest of the system is written in Prolog itself, but compiled into the pseudo-machine code which the virtual machine uses.

Users' programs may also be compiled into this machine code, making them run faster. Alternatively, programs may be kept as text files in the system's database, as is more normal, and interpreted by the Prolog system as necessary.

There are no direct facilities for writing programs within the system. Instead, an editor must be used to create and save a file. Rather than leaving the Prolog system to do this, it's possible to either make use of the Amiga's multi-tasking facilities or the Prolog command `system`, which enables the user to call operating system commands such as `Ed`. Once this is done, the file may either be read into the Prolog database for interpretation with the `consult` command, or compiled with the `compile` command.

Prolog normally operates in query mode, meaning that the user accesses relations in the database and is informed as to the truth or falsity of them according to the data passed to the relations. It is equivalent to calling procedures in a conventional language, and is the only way of 'running' programs.

Writing and testing programs in Prolog can be a confusing business for the uninitiated, so it's good to know that the system provides debugging facilities. The key to this is the `trace` command, which can be used with any relation to let you know when it has been called and whether the result was true or false. In this way, it's possible to see how the interpreter follows the convoluted logic of nested relations.

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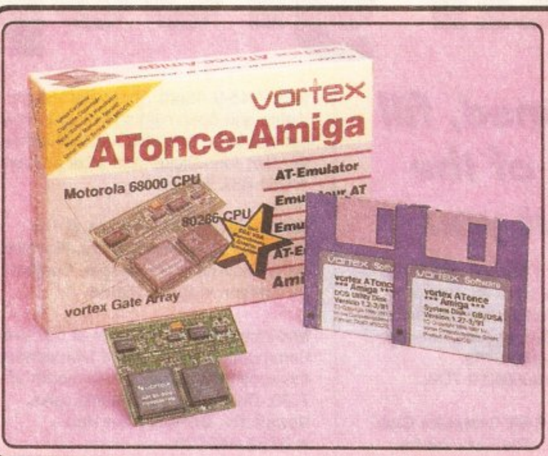
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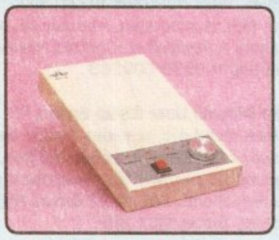
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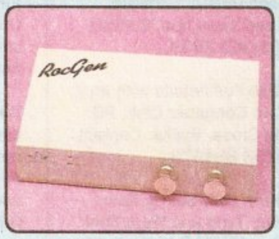
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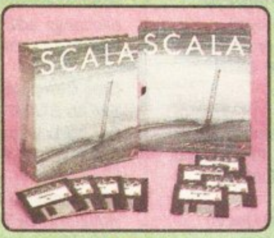
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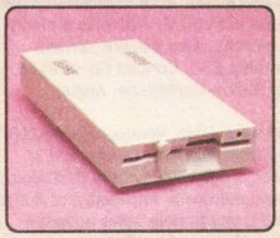
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Public Domain User Group Swaps PD between members, provides advice and reviews of PD. Basic membership free, advanced £3 per year for newsletters and price reductions. SAE to 12 Oxford Road, Guildford, Surrey GU1 3RP.

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Shareware and PD

Phil South takes his usual wander through the world of shareware and public domain software

Welcome once again to the world of Amiga PD. Public domain software is getting more sophisticated by the day, it seems, and while the demos push back the boundaries of art, the utils and applications make using your computer a far easier business.

This month we have another collection of very fine pieces of coding. Some are particularly useful – especially, this month, the ones I've downloaded from the bulletin boards. So let's have a look at what I've found. By the way, I will usually mention any disk numbers and stuff like that after the name of the disk, but if I don't it means you have to ask for the disk by name.

UTILITIES

Utility programs are becoming more refined, and the number of very clever utils you can get for almost any purpose imaginable is growing daily. Some of the best aren't on disk, though. Instead, they are obtainable from the many bulletin board systems around the country.

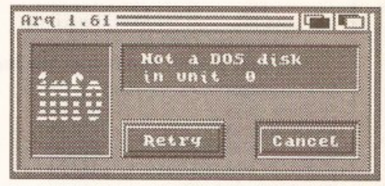
POWERSNAP

Downloaded from CIX

Ever seen a bit of text on the screen in a program and thought that you'd like to take a note of it? So you reach for a bit of paper and labouriously copy the text down and then type it into a document somewhere else. Wouldn't it be nice if you could just stroke the mouse across the text and paste it into the doc? Well now you can, with *PowerSnap.* This is a memory-resident program which allows you to hold down the [Alt] key and cut a bit of text from the screen, then paste it somewhere else. You don't have to be running the program that you paste into at the time you grab, either. The text is stored away in a little buffer somewhere in memory, and you can paste it back any time you like, provided you don't power down in between.

The program is written by Nico Francois of PowerPeak, the maker of the *PowerPacker* program and the famous menu program used on many a PD disk magazine. A 'must-have' for all serious Amiga users.

Value for money......................9/10



***Arq* makes your requesters somewhat more aesthetically pleasing.**

ARQ

Downloaded from CIX

Ever wanted to get rid of those boring messages you get from AmigaDOS? You know, the "Please insert volume Gibbon into any drive"; and "Not a DOS disk in drive df2:" ones. Using the *ARQ* program, all these messages are now nice neat 3D requesters in the centre of the screen, accompanied by a tasteful and simple animation. This makes the Amiga look more like a high-end, expensive system, and is very much an upgrade to a feature that should have been got rid of in Workbench release 2.0 but wasn't.

Value for money......................9/10

LC24-200 FONTS

NBS L503

This is a collection of excellent LQ fonts for downloading – primarily to the Star LC24 printer, but also useful

continued on page 158

BEGINNERS START HERE

Software for free?

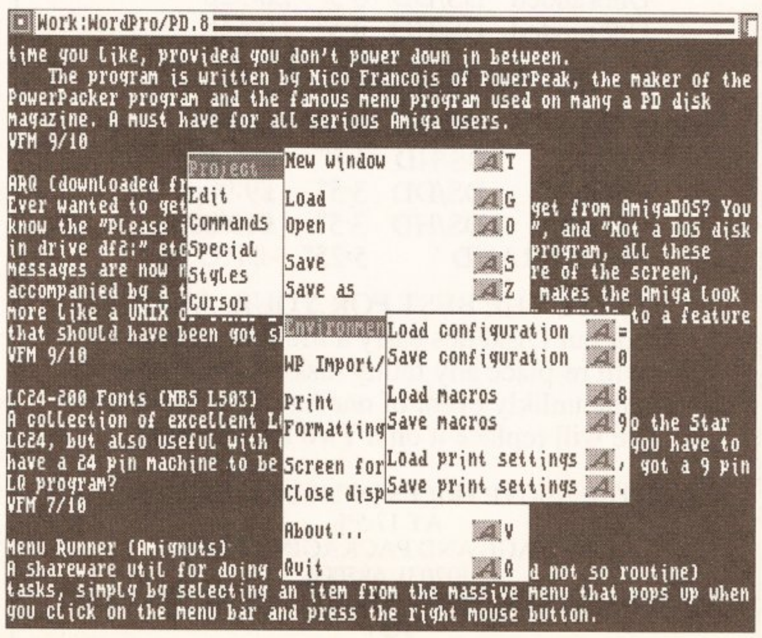
This may sound like a call to piracy, but public domain software is free to anyone. There isn't any catch, unless you count the fact that there is so much PD software on offer that it's hard to choose what you're going to have.

But what does PD mean?

The public domain concept is borrowed from the early days of mainframe systems, where enthusiasts (called 'hackers' then, before the word had less pleasant connotations) produced programs and distributed them to their friends and fellow hackish types, asking for no payment but the glow of being recognised as a truly hackish coder. The copyright was waived by the author, and so the program was said to be in the public domain – that is to say, any member of the public had a right to copy and use the program however they wished, provided that the author's credit and any relevant documentation was distributed with the program.

So how can I get hold of all this wonderful free PD?

Either buy it from a PD library or, if you've got a modem, download it from a bulletin board. These are computers with modems, which anyone can use a phone and modem to log on to, download a lot of demos and utilities, leave a few messages and programs of their own and log off. You'll find that there are many bulletin boards with Amiga files available for download.



***Uedit* (page 142) is a very powerful text editor by Rick Stiles.**

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chaos public domain software
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MUSIC

M0001	Twenty seconds to Comply
M0002	Coma
M0003	Beatmaster - 808 State
M0010	Manic Raves
M0011	Digital Concert I
M0012	Digital Concert II
M0013	Digital Concert III
M0014	Digital Concert IV
M0020	Beatmaster Club Mix
M1001	MED 3.11
M1011	MIDI Utilities 1
M1020	Soundtracker
M1031	CZ Editor. Casio CZ voice editor
M1032	K1 Editor. Kawai K1 voice editor
M1033	K4 Editor. Kawai K4 voice editor
M9901 -	Chaos Samples Disks....
M9910	(For use with Soundtracker, etc)

UTILITIES

U800	Master Virus Killer V2.1
U755	C-Light Ray Tracing Program
U804	MandelMountains
F470	Fortran 77 Prog Language
U760	Fractals Selection
U762	Hard Drive Collection
F219	Astronomy Disk
U810	UEdit Text Editor
U813	Power Packer V2.3
F389	2D/3D graph plotting program
F338	SID 1.6 Disk Tools Utility
U751	Messydos. Amiga-PC Copier
U756	Multiripper
U754	Diskmaster 3
U752	ARP V1.3 with documentation
U753	Red Sector Demo Maker
U806	Jazzbench

DEMOS

D271	Walker demo (1MB)
D264	Spaceship and Sphere 3D animation
D310	Anti Lemmin demo (2MB)
D252	Kefrens Megademo VIII (2 disks)
D253	Predators Megademo (2 disks)
D254	Mental Hangover demo
D255	Virtual Worlds
D258	Probe animation (1MB)
D260	Cebit '90
D301	Cebit '91
D261	Plasmutex '91
D263	Vangelis demo
D267	Chaos Rock
D273	Busy Bee animation (1MB)
D274	Trip to Mars
D276	Killing Gameshow Intro
D277	Turtles
D300	Snowman (1MB)
D282	Boing animation (1MB)
D285	'Real 3D' images

GAMES

G505	Llamatron 2112 (Jeff Minter)
G501	Agatron Star Trek (2 disks)
G502	Megaball/Drip
G503	USA Star Trek (2 disks)
G504	Super Off Road Racer demo
G510	Seven Tiles
G511	Cubulus
G520	The Holy Grail Adventure (1MB)
G522	Tennis

EDUCATION

U900	Blackboard Maths etc (5+)
U901	Spellquiz etc (5+)
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- Phenomena Interspace
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- USA Vs Iraq
- Crusaders Genesis
- Budbrain II
- Harlequin Demo

Top 10 Games

- Megaball
- 7 Tiles
- Drip
- Gridrunner
- Zeus
- Shapes
- Sealance
- Twintris
- Battle Pong
- Atic Atac

Top 10 Utilities

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- R.S.I. Demomaker
- D-Copy
- Label Designer
- Iconmania
- Ham Lab
- SID V1.06
- Assassins Bootblocks
- C-Light
- Cross Dos

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D002	Stealthy 2
D003	Fleet Manoeuvres
D004	Iraq Demo
D005	Naughty Slideshow d1
D006	Naughty Slideshow d2
D007	Safe Sex
D008	Iron Maiden
D009	Lotus Car Chase
D010	Robocop 2 Slideshow
D011	Naughty Cartoons
D012	Robocop 15 seconds
D013	Total Recall
D014	Evil Dead
D015	Alternative Neighbours (X)

GAMES

G001	Missile Command
G002	Pontoon
G003	Risk
G004	Star Trek d1
G005	Star Trek d2
G006	3d Tetris
G007	Tetris
G008	PakMan 81
G009	Monopoly
G010	Games Galore
G011	Chess
G012	Games Disk
G013	Flaschbler
G014	Video Tennis
G015	Holy Grail

MUSIC

M001	Debbie Gibson - Electric Youth d1
M002	Debbie Gibson - Electric Youth d2
M003	Madonna - Spanky
M004	Petshop Boys - Aways On My Mind
M005	Jean M Jarre - Docklands
M006	Music Invasion 2
M007	Betty Boo d1
M008	Betty Boo d2
M009	Madonna - Vogue
M010	Batdance Megamix
M011	Madonna - Like a Virgin
M012	Eve Of The War
M013	Yellow Megamix
M014	Queen - Flash d1
M015	Queen - Flash d2
M016	Loadsamoney Rap
M017	Pet Shop Boys
M018	Jean M Jarre - Live
M019	Genesis
M020	Sam Fox (X)
M021	Queen and Black Box
M022	Dire Straits
M023	Bomb The Base

UTILITIES

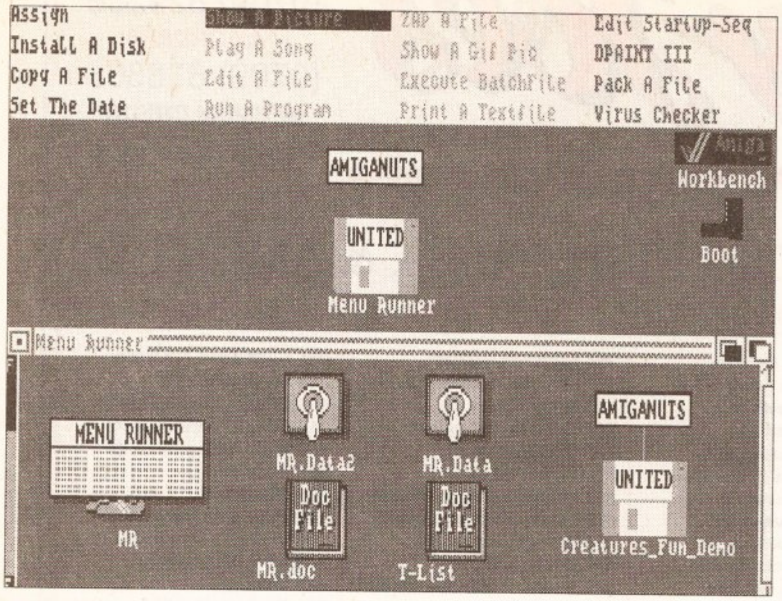
U001	Master Virus Killer
U002	Mega Utility Disk
U003	Amibase
U004	Qbase
U005	Spreadsheet
U006	Journal
U007	Text Plus
U008	CLI Tutor
U009	ZX Spectrum Emulator
U010	Commodore 64 Emulator
U011	Dark Star
U012	Game Music Creator
U013	Sun Dragon Utils
U014	D Copy
U015	Zodiac Compactors
U016	Digi Tech Utils
U017	Wiz Base
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U022	North Sea 1.3
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Menu Runner eases tasks like copying files and checking for viruses.

continued from page 154

with other machines. Lots of fonts, but you need a 24-pin machine to be able to use them. Anyone out there got a 9-pin LQ program?

Value for money......................7/10

MENU RUNNER

Amiganuts

Menu Runner is a shareware utility for doing all manner of routine (and not so routine) tasks, simply by selecting an item from the massive menu that pops up when you click on the menu bar and press the right-hand mouse button. A very handy utility, and one which will find many a happy home in the hands of power users. Don't forget to pay the shareware fee, though!

Value for money......................7/10

APPLICATIONS

There are not so many applications around in pure PD at the moment, although the licenseware scene has really pepped up of late. But how about these little numbers?

UEDIT V2.6

Amiganuts 1162

Shareware version of the popular text editor by Rick Stiles from the USA. *Uedit* is a text editor for technical users. It has many word processing features, but although it can be used to process words, this is not its prime function.

In developing *Uedit*, Rick's aims have been for the user to be able to work without coming up against the limits of power and capacity, to automate repetitive work, and to get rid of the irritation of stodgy performance. It will also let you customise the environment fully, and you are able to create, on the spot, new capabilities that are needed as and when you need them!

This freely distributable shareware version has limitations, but you can get the idea of what using the real thing is like, and use *Uedit* productively while you decide if it's the right program for you. To encourage you to register, the demo has a 4-file limit. In the full version, you are able to edit as many files as you like (to the limit of the computer's memory).

You are not allowed to save a full or partial configuration to disk in the demonstration version, so you can customise while you're using *Uedit*, create and compile new commands, even compile an entire config file, but you cannot save a custom environment to disk for permanent use. Nor will the demo version let you save a learned sequence to disk. You can use the program's learn mode as much as you want, but you can't store the learned sequences for permanent use. The program is an all round good egg though, and using it will give a you a free taste of what's available on the real version. Excellent.

Value for money......................8/10

PAYING FOR IT

Be prepared to pay between 99p and about £2.50 per disk from a PD software house. Whether you pay the lower or higher price is entirely up to you. I suppose the variety in prices depends on how the disks are duplicated. If the company has an office and a duping machine, then it costs money to run. But if it's built the PD house into an existing business, then obviously it has no overheads to speak of. Some 99p PD houses are good, others are terrible. The only way to find out for sure is to spend 99p. Or read *Amiga Shopper* every month for the same price, and find out from us!

WHOM II

17 Bit 1313

People who like *Star Trek* are called Trekkies, so what are *Dr Who* fans called – Who-vers? I don't know. But in any case, this is the definitive guide to the *Dr Who* programme, forming a database that no self-respecting, Dalek-fearing fan should be without. The program allows you to search through every *Dr Who* episode and glean all sorts of information about who was in the show, who directed it and what the names of the technicians were who made it. All the information is cross-referenced, so you can search for information you know is there but can't find, or reveal information you didn't even know existed! A brilliant bit of trivia, and if you're a *Dr Who* fan then you should run out and get a copy of it right away.

Value for money......................9/10

AMIGA FOX 1.10

Office Choice U173

The *Amiga Fox* system is a method of combining text and graphics in a document which you can then print out. I think that 'PD DTP package' is too strong a phrase for it, as the quality is way down there. But I can see that some people may not need high quality, just the ability pure and simple to combine text and graphics. Worth a look just for interest's sake, but have your German dictionary handy, as the text is all Deutsch. OK if you spreche, but not a great deal of cop if you don't.

Value for money......................5/10

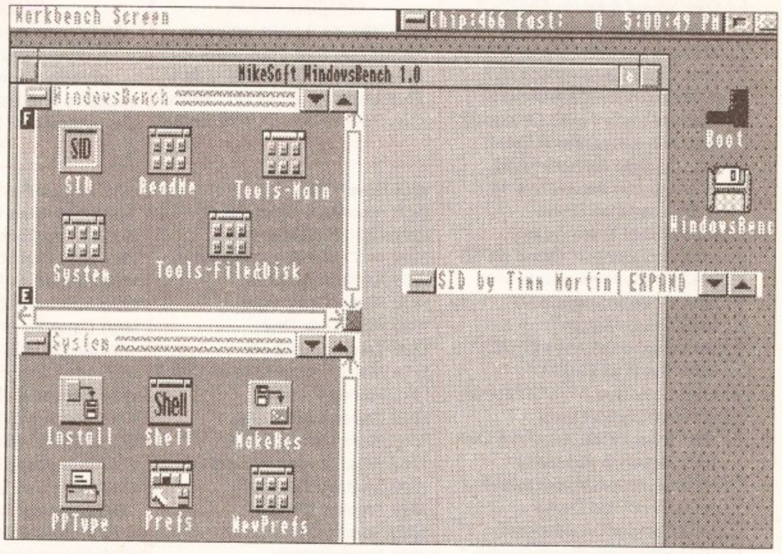
WINDOWSBENCH

NBS U638

An excellent joke, apart from anything else, but also a really good-looking version of Workbench for you to use. The inspiration for this program is the Microsoft Windows graphical user interface (GUI), and everything is geared to make the system look as much like Windows as possible. It's a nice trick, and it's achieved with a range of programs which have been around for a good long time. This isn't a re-write of the Amiga's GUI but a clever illusion, which alters the way you look at your computer so much that it might as well be a different system. Even the familiar Topaz system font is switched for a thinner, more PC-style affair. Icons are provided for you to customise your floppy and hard disk icons for greater similarity to the other GUI, and there are even copies of the regular Windows icons so you can add them to your other programs.

Thanks must go to Mike Doodson of MikeSoft (another pun) for this excellent system which, although not improving the performance of your system, at least makes it look like it's going faster! This is the computer equivalent of racing stripes or neat tail fins. The car analogy follows through. Who cares if it changes the performance, as long as it looks like a racing shark from the Planet Neptune. Very funny.

Value for money......................9/10



One to wind up any PC users you know: *WindowsBench*, from MikeSoft.

MUSIC

Amiga music has come on in leaps and bounds in recent months, and the selections which follow are the best that's around at present. And with the quality improving all the time, I look forward to many a new musical innovation.

continued on page 161

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continued from page 158

TSI-EP3

Amiganuts 1163

This is the new, extended-play digital record from TSI, containing six brand new tracks. Great dance-style music, and all done with the excellent *MED* program by Teijo Kinunnen. The tracks are very nicely produced and mixed, and make full use of the Amiga's sampling and stereo sound-playing facilities. I'd like to see more of this kind of music production – music to listen to, that is. Perhaps TSI could do a whole album like this sometime, but with original sounds and tunes rather than mostly re-mixes or rehashes of current top ten hits. Brilliant job, nonetheless.

Value for money......................7/10

HYPNOSIS GNUDUNK

17 Bit 1304

Eight slightly insipid tunes from the Hypnosis group, but with an excellently coded music player called *GNUDunk*, for reasons best known to the authors. Some good tunes, some very bad, but all listenable provided you like endless tinkling Europop elevator music. I don't.

Value for money......................4/10

RADISH SAMPLES

17 Bit 1308

A selection of samples usable in *Soundtracker*- or *Noisetracker*-type music programs. Many are gleaned from current chart hits, and although you may think that copyright is a problem, in most cases the owner of the copyright won't recognise such a tiny snatch of their music. And besides, most users of Amiga samples won't be using them for money-making purposes – not like some of the DJs and remix artists currently in the charts.

Indeed, a lot of these records are sampled from others, which reminds me of the old Stock Aitken and Waterman story about them apologising to someone for sampling a sound off their record. The artist in question shrugged and said, "It's OK, and besides I sampled it off of one of your records anyway!"

Value for money......................6/10

GRAPHICS

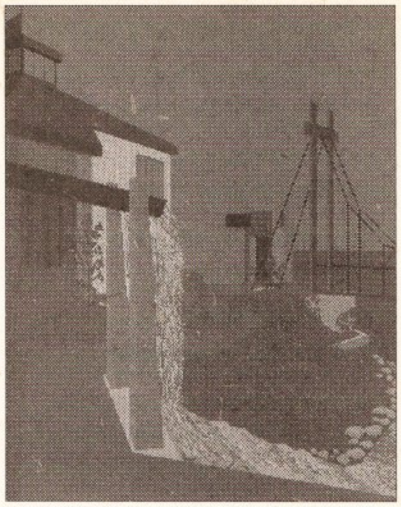
There are some awesome artists out there, and more and more are turning to the Amiga for their graphics. There was a time when the only computer used for graphics by professionals was the Apple Mac, but now this looks set to change.

DAVID BODDY

Amiganuts 1177

A selection of works by David Boddy, an Amiga artist working for E S & A Computer Graphics in the USA. Some very slick work here, including designs for a national aquarium building, a war memorial, and a number of very flashy business cards. Lovely to look at – a very good demo of how to use the Amiga's graphics for a real-world purpose.

Value for money......................5/10



One of the David Boddy images: "very slick work."

CLASSY ANIMATIONS 5

NBS H654

Six more animation files produced by Steve Packer. In this set we get to see Chuck shooting down an Aerotoons plane, taking an acid bath, taking the lead role in *Total Recall* and featuring in a database of his many disguises. I must say that I've seen all the *Classy Animations* series, and this is the first one I thought was any good. Very cleverly done, especially the *Total Recall Chuck* and *Chuck's Revenge 2*.

Value for money......................6/10

VARIOUS ANIMATIONS

Amiganuts 1170, 1169, 1167, 1166, 1165, 1174

These are a number of very high-quality ray-traced animations from Leo Martin, all of which are fully rendered and beautifully animated. The program used to create these programs was *Sculpt Animate 4D*, and the machine was a super-fast Amiga 2500. The subjects are so diverse as to boggle the brain. The contents of the disks listed are, in order of disk number above: The Boings are a couple of bouncy little cartoon characters. Time Flies is a surreal animation involving a beautiful metallic green clock. Orbiters is a simple but effective anim of two small chrome balls orbiting a big one. Busy Bee is a pastiche on the famous Pixar Bee, with a little happy cartoon bee flying around in and out of the screen. Warp Drive shows a very sleek and shiny space ship rotating around in space and zooming off into hyperspace. Finally, the Trek Anim shows the Enterprise shooting its phaser banks at a Klingon bird of prey. The quality of animation is first class, although Tobias Richter does better *Star Trek* animations. Well worth a look if you like raytraced animations.

Value for money......................9/10

3D OBJECTS DISK 1

Amiganuts

A bunch of *Sculpt*-format objects by Leo Martin, including Klingon Battle Cruiser, Romulan Bird of Prey, Scout-sized Starfighter, HoverCar (a hovercraft of the future), a floppy disk, an hour glass, Mr Boing, Boing Jr., Spelling Bee, and a Light Cycle (from the movie *Tron*, of course).

Leo says on the doc files that this disk is shareware. A donation of $15 pays for your use of the disk. The honest responses he gets will determine whether or not he continues to produce more 3D objects. Watch out for *3D Objects Disk 2*, which is now available, containing more *Sculpt* objects such as the starship Enterprise, Insectoid (half insect, half android!), FutureCar (Speedster from the year 2000), a Recognizer from the movie *Tron* and many more.

Value for money......................9/10

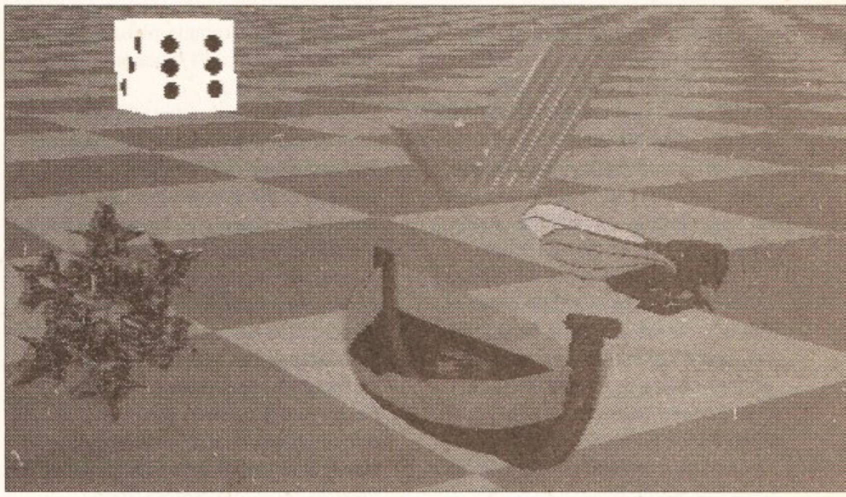
ANIMATION AND VIDEO

Amiganuts 1176 – 2 disks

These two disks contain a wide assortment of art, animation, objects and utilities designed with the Amiga artist, animator and video user in mind. The materials on the disks were created especially for this set: for example, the 3D objects are all-new material by two of the best known 3D modellers in the Amiga community, Allen Hastings and Louis Markoya.

The animbrushes (for use with Electronic Arts' *Deluxe Paint III* paint and animation program) were specially created by the famous Amiga artist Rick Parks, whose work continues to astonish after all these years. The subjects are a butterfly, a walking male, a walking female and male and female facial features, all very animated. Of these, only the butterfly is already in the animbrush format; because of space constraints

continued on page 162



The Louis Markoya objects, including boat, check, dice, fly and snowflake.

WHAT IS CIX?

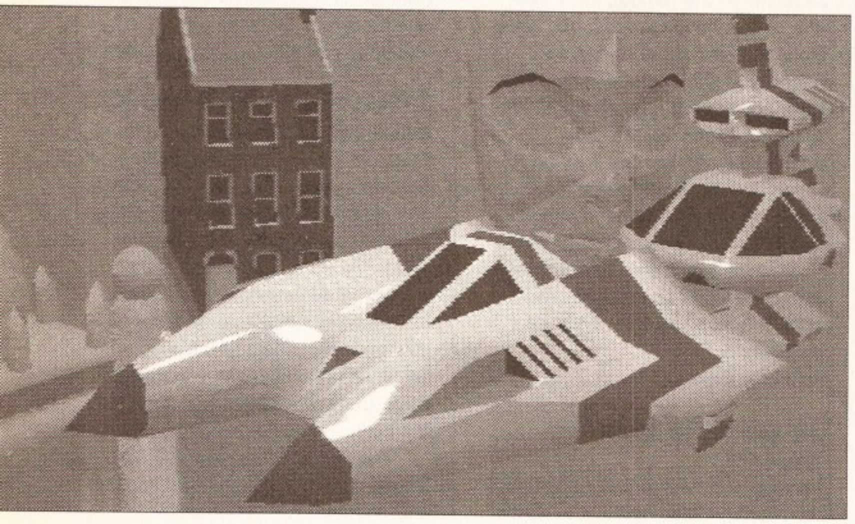
CIX, short for Compulink Information eXchange, is an on-line conferencing system where, for a (reasonably) small fee, enthusiasts can discuss anything from the Amiga to aeronautics, from the availability of public domain software to potholing.

To join CIX you need a modem which is capable of at least 1,200 baud data transfer. Then just dial 081-390 1244, with your modem set to 8 data bits, 1 stop bit and no parity. Type 'cix' at the initial 'login:' prompt, and then type 'new' to register yourself as a new user – you'll need a credit card number to register.

When you've joined, why not drop in to *Amiga Shopper*'s own conference – called 'amigashopper' – for a chat? You'll find that contributors such as Gary Whiteley, Phil South, Mark Smiddy and Ian Wrigley all regularly log in, so if there's anything you want to say to them, CIX is probably the best way of doing so. And as well as just chatting, there's megabytes of software available for downloading – Phil looks at just a fraction of what's there in Public Domain World this month.

continued from page 161

on the disk the rest are available as animations that can be loaded by *Deluxe Paint III*. Once loaded, you can cut out the animbrushes using the 'Animbrush Pick Up' option. Do view these files first – you have to load *DPaint III*, then select Load from the ANIM or ANIMBRUSH menus.



The Allen Hastings objects, including GoldMask, MoslemTomb, RowHouse, Starfighter1 and Starfighter2.

Both of the colorfonts on the disk were designed by Kara Blohm of KARA Computer Graphics. One, CHISELserif, was on the *Deluxe Paint III* disk, while the other, called Tubular, is completely new. To use them you will need a paint program that is colorfont compatible, such as *Deluxe paint III* or *Photon Paint*.

Also on disk one are IFF pictures of the 3D objects found on disk two. These pictures are there so that you can see what the objects look like without having to render them up first! To view them, in fact, you just double-click on the icons.

As I said before, on disk two you have the actual objects in both *Sculpt* and *Turbo Silver 3.0* formats. To use these objects, you will need to load either *Sculpt* or *Turbo Silver*, then load the objects into the computer from within the 3D programs themselves. VideoScape and even Video Toaster users can make use of these objects if they have the extremely useful *InterChange* program by Syndesis, which can be used to transform 3D objects between a number of different programs' formats.

Value for money......................7/10

CSIRO SATELLITE PICTURES

Amiganuts 1178 – 2 disks

The images on these disks are thermal infra-red 'pictures' of various regions of Australia from the NOAA satellite. (Our example picture shows Spencer Gulf and St Vincents Gulf in South Australia.)

On each screen, the different temperatures are shown by different colours, using red for the hottest areas and going down through the spectrum to blue and then black for the coldest areas. The difference in temperatures shows up various geographic features on the land – lakes and rivers, for example – and also differences in ground cover – for instance, forests versus cleared fields. In the oceans, the temperature variations show up the currents in the water because water masses tend to maintain their temperature as they move around.

The *Display* program that the scientists at CSIRO use is included with the disks, so you can experiment with different 'Stretch' values to see various features hidden to view on a first look. These are real satellite pictures used for real work, available to the home user for the first time. (The images are provided for Amiganuts with the permission of the CSIRO Division of Oceanography, Hobart, Tasmania.)

Value for money......................8/10

NEPTUNE PICS

Amiganuts 1179 – 2 disks

Still keeping the space theme, here we have a two-disk set of NASA JPL pictures of Neptune. I don't know about you, but I love anything to do with space exploration, and these are about as hot off the press as you get. Yes, I know it all happened about two years ago, but this is the first time that NASA pictures have been distributed in this form.

The images reached the public domain via a slightly convoluted route. Towards the end of August 1989, a set of black and white digitised images of the Voyager flypast of Neptune were made available at Stanford in the USA. These images apparently remain copyrighted by NASA JPL, but "may be used for viewing and to further the cause of space exploration", according to the notes. The popularity of these images was enormous and required that they be moved to another machine more able to cope with the volume of requests for them. These images were originally viewable on the Amiga, using DigiView.

Finally, this set of images was posted, in Amiga format, by Joe Smith of McDonnell Douglas, to yet another university from whence the Australian gent who released them was able to transfer them to his account at Melbourne University.

This really is spellbinding stuff, and if you like this sort of thing I urge you to get this set from Amiganuts, or anywhere else it may turn up.

Value for money......................9/10

DISK MAGAZINES

The disk magazine scene is very healthy, with more appearing all the time. Nice to see that *TBag*, *Scanner* and *The Disk* are still operating, as these are some of the best around, with lots of very good utilities and demos on them.

SCANNER 3

Telescan – 2 disks

Still scoring high marks for its presentation and content, the *Scanner* mag is into issue 3, with its compilation disk (*Humdinger*) following on close behind. In this two-disk issue we have the utilities *Menumaster*, *DosHelp*, *Glossary*, the *Kefrens* IFF Converter, *SpectraPaint*, and animated pointers, plus the demos *Substance*, *Tunnel* and *Juggette 2 – The Revenge* by Eric Schwartz, and the games *H-Ball*, *Mosaic*, *Tetrix* (Metallica) and *Dilemma*. The latter is an excellent and addictive game written entirely in compiled AMOS. As well as all the documentation for the program, there is a lot of text to read (this is supposed to be a magazine, after all) with the regular roundups of PD, reviews, competitions and special offers, plus a look at the new Action Replay cartridges and the second part of a feature on using modems. So lots to read, and lots to play with as well. Another issue bristling with ideas, and representing some of the best value for money in the disk magazine market.

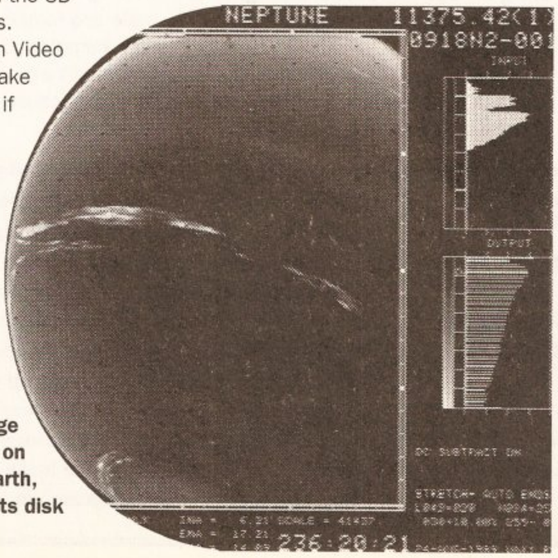
Value for money......................8/10

HUMDINGER 41

Telescan – 2 disks

There are 41 of the best PD games on this two-disk set. The best PD value for the kids in your life. This really is the most fun you can have without paying a fortune. The trick with PD games is that the gameplay is usually very good, as they are

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The left-hand image is from Amiganuts 1179, and is an image of Neptune. The one on the right is planet Earth, and is from Amiganuts disk number 1178.

UNIQUE

All the **BEST** Public Domain, Shareware and Licenseware Disks every one checked and guaranteed **Virus Free.** ✔

? = Memory Required   * ? = Number of disks in Set   +2 = 2 Disk Drives Required

FISH DISKS



1 to 560

The Unique Fisk Disks are originals, delivered on release, by courier from the U.S.A.

FF-543 PReader V5.1 - An all purpose reader that displays text, pictures, sounds and animations.

FF-546 DiskPrint V3.1,2 - Print labels for 3.5" or 5.25" disks with lots of built in features.

FF-547 EasyExpress - A compiler tool for users of A68K and Blink EasyExpress does the same job better than your batch file and is much easier to change. If you use many object files Easy Express will make life much easier. You can do almost everything via mouse.

FF-549 Verse Wise V1.0 - The Gospels (Matthew, Mark, Luke & John) View - Output - Search.

NEWSFLASH

UNITED GRAPHIC ARTISTS

The Ultimate Disk Based Magazine

Software & Hardware features, A programming & Help Section, Utilities & Creative section...A must for all serious Amiga Users, released every six weeks. Issue #21 available now! only £4.99 per two disk issue.

T-BAG 1 - 54

The Tampa Bay Amiga Group

Lots of useful Games, Graphics Music and Utilities all easily accessible from a workbench environment.

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LICENSEWARE

This excellent software is not public domain and is charged at £3.50 per disk or £5.50 for a two disk set. This includes royalties to the authors.

LPD-01 Colouring Book
LPD-02 Arc Angels Maths
LPD-04 Thingmajig
LPD-05 Jungle Bungle #1
LPD-06 Pukadu & Sprite 600
LPD-07 4-Way Linx #1
LPD-08 Work & Play #1
LPD-09 Amos Assembler
LPD-10 Word Factory #1
LPD-11 Go Getter #1
LPD-12 Hypnotic Land #1
LPD-13 Jigmania #1
LPD-14 Play It Safe #1
LPD-15 Arc Angels Shapes #1
LPD-16 Reversi II #1
LPD-17 Dogfight II #1
LPD-18 Touch Stones
LPD-19 X-It-50
LPD-20 Wordy
LPD-21 Quingo
LPD-22 LC10 Fonts
LPD-23 E.S.P.
LPD-24 Way of Kung Fu #1 *2
LPD-25 The Mission #1
LPD-26 C.Y.A.D. #1
LPD-27 Flower Power #1
LPD-28 BudBase 1 #1
LPD-29 Big Top Fun #1
LPD-30 Shymer #1
LPD-31 CLI Printer Dump
LPD-32 Hard Drive Menu #1
LPD-33 Adventure Toolkit
LPD-34 Invoice Printer #1
LPD-35 T-TeeDraw #1
LPD-36 FracGen #1
LPD-37 Rocket Maths #1
LPD-38 Amos Art
LPD-39 Magic Forest II #1
LPD-40 Sprite Bank Editor
LPD-41 Rescue
LPD-42 X-Switch

These disks were once known as AMOS licenseware and have received favourable reviews!

UTILITIES

UT-013 Icon Mania (Icon Utils)
UT-014 Amiga Systems Test
UT-015 Flexibase V2.0 (Database)
UT-016 AmiBase V3.76 (Database)
UT-018 D-Copy (Disk Copier)
UT-019 Clerk V3.0 (Accounts)
UT-020 Jazz Bench #1
UT-021 Rim Database #1
UT-024 Design Factory *3
UT-040 Kefrens Metallion Utilities
UT-041 VisiCalc V3.0
UT-043 C-Light (Ray Tracing) #1
UT-044 M-Cad #1
UT-045 Unique Utils 01
UT-046 Unique Utils 02
UT-048 Sound Tracker V2.2/.3/.4/.5
UT-055 Star Trekker V1.2 #1
UT-060 A Gene V1.3
UT-063 Uedit V2.6c #1
UT-064 Complete C Manual V2.0 *4
UT-068 Text Plus V2.2E (Word Pro)
UT-070 Catalogue Utils *2
UT-072 Bank'n V1.5
UT-073 Virus X V5.0 Zero Virus III
UT-074 Mandel Vroom
UT-075 Mandel Mountains & Anim
UT-080 The A64 Package (Emulator)
UT-081 Clip Art *7
UT-091 Noise Tracker V2.0 #1
UT-092 Master Virus Killer V2.1
UT-094 AmiGazer & Star Chart
UT-095 Magnetic Pages V1.0 #1
UT-096 Data Easy (Database)
UT-097 North C V1.3 *2
UT-100 Unique Fonts 100+ *3
UT-103 Red Sector Demo Maker #1
UT-104 Journal V2.0
UT-107 TSB Vector Designer V1.1
UT-108 Print Studio V1.25
UT-110 MED V3.1 #1 *2
UT-112 Ham Lab Demo
UT-116 Clip It Vol 1 *5
UT-121 Clip It Vol 2 *5
UT-126 Clip It Vol 3 *5
UT-131 Clip It Vol 4 *5
UT-136 Modula II (Language)
UT-137 Games Music Creator
UT-138 Oktalyzer (8 track)
UT-139 DrawMap V2.30D
UT-142 MessySid
UT-143 Cryptic Amiga Emulators

GAMES

GA-001 Star Trek *2
GA-004 Holy Grail (Adventure) #1
GA-010 Golden Fleece (Adventure)
GA-013 Emerald Mine 3
GA-015 Flaschbier #1
GA-032 Frantic Freddie
GA-033 Castle of Doom (Adventure)
GA-034 Colossal & World (Adventure)
GA-035 SlotCars, AmiGo, Sensopro etc
GA-036 Amigoids, Amoeba, Paccer etc
GA-037 TrekTrivia II, Chess, Reversi
GA-039 Sorry, Retaliator & Pacman 87
GA-041 Escape from Jovi III
GA-044 MarbleSlide, Lore of Conquest
GA-045 Down Hill, Hollywood & MM
GA-046 TrekTrivia 3, Space War & Tron
GA-047 Tricky, Drive Wars, etc
GA-048 Puzz, Sys, MiniBlast etc
GA-049 PipeLine, Missile Command
GA-050 Snake Pit China Challenge etc
GA-051 Shanghai, Clue, Othello etc
GA-052 Black Jack Lab & Moonbase
GA-053 Rings of Zon (Adventure)
GA-054 Empire
GA-058 Paranoid
GA-059 Drip & Roll on #1
GA-061 Sea Lance, Humartia etc #1
GA-069 Jeopard, Yelp etc #1
GA-081 Mental Image Game Disk 1 #1
GA-082 Seven Tiles
GA-085 Llamatron
GA-086 Dynamite Dick #1
GA-088 Battle Pong #1
GA-090 Wizzy's Quest #1
GA-091 Roller Pede & MegaBall #1
GA-092 Destination MoonBase
GA-096 Dragon Cave
GA-099 HackLight #1 *2
GA-104 Property Market V1.1

ANIMATIONS

AN-001 Juggler & Juggette #1
AN-024 Stealthy II & Terminal #1
AN-030 Puggs in Space
AN-032 Ghost Pool & Spigot #1
AN-051 At the Movies #1.5
AN-052 Juggler II & Juggette II #1
AN-056 Vaux Killer *2 #2
AN-058 Coyote II #1.5
AN-059 Swiss F-16 Combat #1.5
AN-064 Miss Mamselle #1.5
AN-087 Light Cycles #1 *2
AN-093 The Dating Game #3 *2
AN-095 Anti Lemmings #2 *2
AN-102 Franklin Fly #1
AN-106 Shuttlecock & Vietnam #1
AN-107 Buzzed *3 #2
AN-116 The Magician II #1
AN-122 Trackball #1
AN-123 Showtime #1

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EUROPE

All Public Domain & Shareware Disks are £2.00 per disk. Minimum order £10. Price includes Airmail. Payment by bankers draft in pounds sterling drawn on a bank in the UK

REST OF WORLD

All Public Domain & Shareware Disks are £2.50 per disk. Minimum order £10. Price includes Airmail. Payment by bankers draft in pounds sterling drawn on a bank in the UK.

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based on traditional classics like invaders or asteroids, so the graphics don't have to be brilliant. In some cases they are, but this isn't the rule. Great and very diverting fun. Oh, and watch out for *Welltris*. I played it for two hours at a stretch and it nearly drove me stark raving bonkers.

Value for money......................9/10

LAZERDISK 1

This is a new disk magazine from James Deavall, and it's not at all bad for a first effort. The disk contains five utilities, three demos and four games, all for £1.50. The games are *Blob*, *Othello*, *Puzzle* and *Mr Munk*, and the demos are by Rebels, Dual Crew and No Limits. Not ultra-new stuff, but then very few first disk mags are. The articles are OK too, consisting mostly of reviews and some welcome and subscription information. The utilities are *Pointer Animator* (which is also on *Scanner*), *BlitzFonts*, *TextEngine* and *PicSaver*, a kind of screen snapshotter like the one I use to get screengrabs of programs into *Amiga Shopper*. Also included is *Rainbow Writer*, an intro maker allowing you to save off neat little introductions to disks which will boot and type information on to the screen with some rainbow text and a starfield behind it.

I look forward to seeing how the mag shapes up in later issues, because they normally improve after the initial flush of blood to the head. Once that's out of the system, then the selection becomes more eclectic, and the style of the presentation comes to rely less on the flashy graphics and special effects and more on the quality of the programs. As I say, very neatly put together and all useful stuff.

Value for money......................7/10

THE DISK 4

Yet again, Steve turns out a neat and tidy disk mag brimming with good ideas. No fancy graphics or title pictures, just a single disk packed to the gunwales with excellent stuff. *JPClock* is a very slick menu bar clock, which can even be programmed to stay on the top screen of your multitasking environment. It has an alarm, which means you will always be aware of the time, even when you're ray-tracing. *TitanCrunch* is a file packer a little like *PowerPacker* or *Imploder*, and is very popular in Europe I understand. There are a pair of new bitmapped fonts on the disk, called Expanded and Gothic, which you can copy straight into your fonts directory and use right away. *StepRate* is a program to increase (or decrease, or at least set) the speed of your disk

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WHAT'S AVAILABLE?

Utilities

These are programs which help you use your computer. Some are just simple commands for your C directory for use from the CLI or Shell, while others are complete menu-driven programs to compress files, convert them from one format to another or even rescue broken disks. The best disks to look for are the collections with a selection of the best utils all squeezed on to one disk.

Applications

Some of the best programs are PD. *SID*, for example, is one of the best graphic interfaces for AmigaDOS, and it's PD (or, to be more precise, 'shareware'). *SID* is a graphic front end for the AmigaDOS file system, allowing you to move files around, delete them, rename them, copy them and re-organise your disks. In fact, I don't know a single Amigahead who would be without their copy of the program. And there are many other kinds of programs too, from business to graphics applications. Check the PD libraries before you lash out some cash on a commercial program – you may find a public domain solution which could save you pounds.

Demos

This is a new art form. The demos are created by a team of hackers, usually called a 'crew' or 'team', who get together and have a 'late night hack attack' and create a dazzling demonstration of their programming abilities. The demos can be graphics- or music-based, but they always have the feel of a pop video, and the music is generally of the dance variety, although some more exotic sonix do come out from time to time. Demo teams usually go on to be professional programmers after a while, so their demo days are usually limited. Scoopex and Silents are two of the best teams, and also the likes of Kefrens are not to be missed. Imagine a cross between a dance record, a video and a lightshow and you're getting the general idea.

Game demos

In recent years, the various major software houses have watched the PD arena growing and have noticed that lots of people buy demo disks. So they put out demos of their new releases, allowing the punters to try the game before they buy. Demos of this kind usually turn up on the covers of magazines like our sister publication *Amiga Format*, and then before long the demos turn up on their own in PD libraries. A successful and popular demo translates into a very popular game – for example, take note of the enormous success of *Lemmings*, from Psygnosis, which started life as just such a demo.

Slideshows

Some Amiga artists spend a lot of time creating works of art on their computers, which is no good if nobody sees them. So many Amiga artists make slideshows of their work for public consumption. If you're very clever (or own one of the fab new snapshot cartridges) you can grab the art and examine it to see how it was done, and you could even use it as clip art in your DTP packages. (Beware, though, some PD artists may get a bit cross if you do. Remember that unless explicitly stated, copyright remains with the artist, which means that you can't reproduce the work without their permission.) Some of the most stunning Amiga art comes from a chap called Tobias Richter, an artist who lives in Germany. He uses a ray-tracer called *Reflections* (coming soon to the UK), and turns out some amazing stills and animations based on *Star Trek* and other sci-fi subjects. Watch out for him under the name Agatron.

Music Demos

Some PD authors are music nuts, who spend their lives churning out disks of tunes for you to play on your Amiga. Some are *Soundtracker-* or *Noisetracker*-sampled tunes from the charts, re-mixed in the Amiga. Others are synthesized tunes from the classics. Most are pretty good. If you like well-sequenced music, I think you'll be surprised at the very high quality of the tunes around on the Amiga PD circuit.

Disk magazines

Magazines on disk are not new, but there are more now than ever before. *Newsflash*, *17 Bit Update*, *Computer Lynx*, *Scanner* and *Jumpdisk* are prime examples of the type of thing I'm talking about and they are, on the whole, very good. Magazines of this type usually contain PD software, demos and music, plus a lot of graphics and text as well. The text is normally reviews of software and hardware, and is usually quite short to keep the amount of different text files up and leave space for programs too. The text is sometimes a bit on the ropey side, but that's what you get for having a writer who's an editor too. A spelling checker wouldn't hurt some of these guys, I can tell you. Not, of course, unless you hit them with the disk!

PD categories

There are some varieties of public domain software which are not free to all. These are:

1 Licenseware

These are programs which are licensed to specific PD houses, to prevent the free distribution of the program – although the price to the consumer is more or less the same. *MED* is a good example; it's a music program which is licensed to Amiganuts United. This program is sold by Amiganuts, and a proportion of the fee goes back to the author in Finland. This scheme works better than shareware (see below) from the authors' point of view, as the money is handed over when the disk is purchased, rather than trusting the users to pay up later.

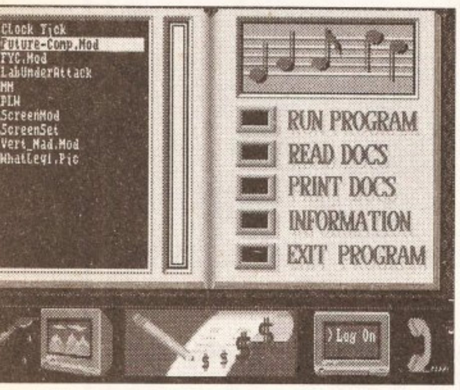
2 Shareware

This is a branch of PD that you pay for, but are allowed to use free for a short time first to see if you like it. It isn't expensive, as the author usually only asks for between £5 and £25 for his or her efforts. In most cases it's worth paying in the end, as you get free upgrades and documentation.

There are lots of 'ware'-type schemes. Freeware is usually the name given to normal PD. Beerware was one idea where the fee for using the program was to send the author some beer. Exclusiveware is a new idea, which works a lot like licenseware. Others, like Charityware – if you keep the program you are requested to donate a sum of money to a charity – are reasonably easy to work out from their descriptions.

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drives. Now I've never heard of that one before! *SuperEd* is a text editor – and not a bad one at that. The games are the usual, and quite fun. *TetraCopy* is a new copying program, to take all the wear and tear out of copying 600 PD or demo disks at



TBag 58 **contains some interesting stuff – but is the quality slipping?**

computer shows, but with the side benefit of a game of *Tetris* to play while you're waiting for the disk to copy! (Ah, the joys of multi-tasking.) Using the copier, you can copy AmigaDOS and Nibble, Repair, Check, Format, and Erase disks. Excellent! *LabelPrint* is just that – a disk label printer. And finally *Typing Tutor* is a shareware typing tutor program (*Quel surprise*), which trains you to type faster. I tried it and yes, it actually works.

The Disk is a refreshing change from many of the disks you get in the PD world, which are just a rehash of old programs that you've seen millions of times before. The programs are new, never before seen and fresh as a lettuce, and from this description you can judge that I'm pretty impressed. Steve chooses his programs with great care, and it shows. Keep up the good work!

Value for money......................8/10

TBAG 58
Amiganuts

Not as fun-packed as the last couple of *TBags*, with a program to alter your sleep bubble to a ticking clock, a trio of *Soundtracker* modules, Tobias Richter's Lab Under Attack picture and a handful of other utils like the *Phone Watcher* program. This monitors incoming calls, to give you a direct index of how many times you got called, how many rings and how many log-ons (provided you have a BBS set up, that is.)

It's good, as they say in the DTI commercials, "but it's no doing *great*!"

Value for money......................5/10

DEMOS

The demo scene has been a bit dry recently, with various crews rehashing the same old effects in answer to the last demo by another crew. But there are still some people turning out eye-scorching demos with a lot of original and entertaining effects. Here's one of the best.

NO REALITY
NBS D713

The Devils team's newest demo, featuring some very nicely coded vector and plasma effects (and combinations of the two), plus some of the best light source shading I've seen for a long time. Also featuring some super-fast fractal light source shaded landscapes, real time rendered HAM overscan fractal and Julia sets (wow!), and something that the team calls HAM RGB Keftals, whatever they might be! Looks like a sort of wobbling plasma tartan effect. Eye-popping.

Value for money......................7/10

TAIL END

If you have the Tomsoft *Virtual World* demo which I mentioned last month, watch out. It might just have the Saddam virus attached to to it. This is a link virus, so you'll need to run a virus checker program over the files rather than over the bootblocks. (I use *Virus Checker v5.26* by John Veldthuis, which I downloaded from CIX but which should be available from most PD houses.) Fortunately the virus doesn't spread unless you write to the disk, which for a demo isn't really likely. But it's better to be safe than sorry!

HANCOCK COUNTRY

Just a quick note to any modem users out there who like PD software. The Cheam Amiga BBS is a top-notch system which, as well as having public areas where people can upload and download software to each other, also has the entire Fish library for download. If you need a specific Fish program, you can look it up using Aquarium (also available for download), and then download the disk you need from the system. Cheam Amiga is on 081-644 8714, 24 hours a day at all speeds you care to mention, even HST. It's a friendly and comprehensive system, with lots of nice downloads. (Don't forget to upload as well, though, as nobody likes a person who just takes, takes, takes!) AS

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BUYING ADVICE FOR SHOPPERS

Whether buying over the phone or at a local store, here's our advice on how to get what you want

BUYING IN PERSON

- Where possible, always test any software and hardware in the shop before taking it home, to make sure that it works properly.
- Make sure you have all the necessary leads, manuals or other accessories you need.
- Don't forget to keep your receipt.

BUYING BY PHONE

- Be as clear as possible when stating what you want to buy. Make sure you confirm all the technical details of what you are buying. Some things to bear in mind are version numbers, memory requirements, other required hardware or software and compatibility with your particular model of Amiga (that is, make sure you know which version of Kickstart you have).
- Check the price you are asked to pay, and make sure that it's the same as the price advertised.
- Check that what you are ordering is actually in stock.
- Check when and how the article will be delivered, and that any extra charges are as stated on the advert.
- Make a note of the date and time when you order the product.

BUYING BY POST

As with buying by phone, you should clearly state exactly what it is you are buying, at what price (refer to the magazine, page and issue number where it's advertised) and give any relevant information about your system set-up where necessary. You should also make sure you keep copies of all correspondence both to and from the company concerned.

MAKING RETURNS

Whichever method you buy by, you are entitled to return a product if it fails to meet any one of the following three criteria:

- The goods must be of 'merchantable quality'.
- The goods must be 'as described'.
- The goods must be fit for the purpose for which they were sold.

If they fail to satisfy any or all of the criteria, then you are then entitled to:

- Return them for a refund.
- Receive compensation for part of the value.
- Get a replacement or free repair.

When returning anything, ensure that you have proof of purchase and that you return the item as soon as possible after receiving it. For this reason it is important that you check the hardware or software as soon as it is delivered to make sure everything you ordered is there and works as it is supposed to.

HOW TO PAY

Paying by credit card is the most sensible way, whether buying in person, by post or on the phone, because you may be able to claim the money from the credit card company even if the firm you ordered from has gone bust or refuses to help sort out your problem.

Otherwise, you should pay by crossed cheque or postal order – never send coins or notes through the mail.

GETTING REPAIRS

Always check the conditions of the guarantee, and servicing and replacement policy, so that you know what level of support to expect. Always fill in and return warranty cards as soon as possible, and make sure that you are aware of all the conditions contained in the guarantee.

BUYING PD

Even though PD software is relatively inexpensive, you should still apply the guidelines set out above, making sure that you confirm all orders as clearly as possible.

Shopping around is still important when buying PD because different houses charge different prices for the same disks. There is no set pricing structure for disks, but bear in mind that PD houses are, in theory, supposed to be non-profit making operations. AS

A CHECK LIST FOR MAIL ORDER BUYING

1 **Make sure you know exactly what you want. Draw up a checklist of the specifications you are looking for and what you want it to be able to do. Check with the suppliers that their product matches your list**

2 **Will the product you have in mind work with your existing set-up, and anything else you are planning to buy?**

3 **Can you see a demonstration? Many products are on display at computer shows around the country.**

4 **Are there any hidden extras? Does it need 1Mb to run, or a hard disk?**

5 **What technical support is provided by the supplier? Does the manufacturer offer after-sales advice? Check before you buy.**

6 **Check the guarantee terms. How long is the free warranty? What does it offer?**

7 **Draw up a list of these details and make them a condition of your order.**

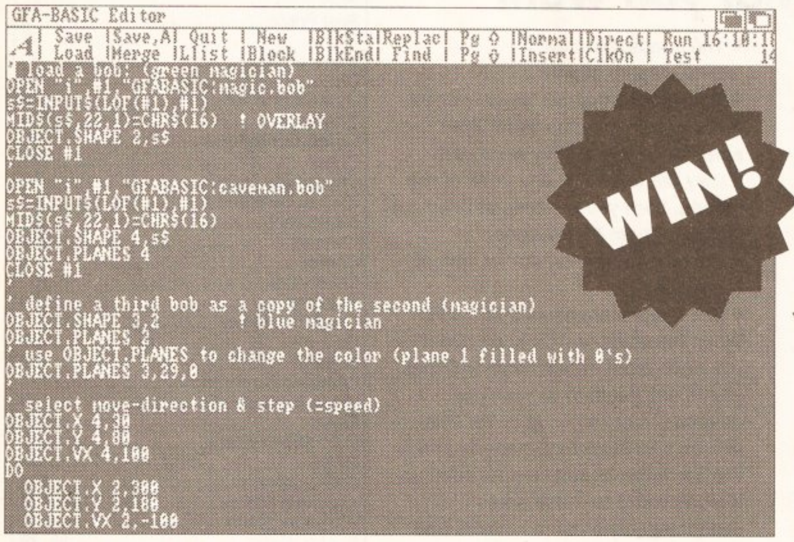
8 **Check the price and delivery details when you order, and make a note of them.**

9 **Note down when you placed the order and who you spoke to.**

10 **When it arrives, check everything carefully. If anything is missing, don't use the product at all – contact the supplier. If it doesn't work, make the obvious checks such as the fuse. If it still doesn't work don't try to fix it – contact the supplier.**

ADVERTISERS INDEX

Six copies of GFA Basic up for grabs



GFA Basic is one of the most popular and powerful programming languages available for the Amiga.

Follow our Basic tutorial with your very own copy of GFA's acclaimed version of the popular Basic language, courtesy of our competition..

You may have been following Dean Cracknell's Basic programming articles each month in *Amiga Shopper*. Now we had to choose a particular variant on the language to use for the examples, and the one we selected was the well-respected GFA Basic.

Of course if you haven't got GFA Basic that means that you have to translate some of the examples into the appropriate syntax. Now you can avoid that chore by owning your own copy of the language, courtesy of GFA and *Amiga Shopper*.

We have six copies of the language to give away, and as always all you have to do to enter is to answer the simple questions. Send your answers, along with your name and address, on a postcard or back of a stuck down envelope to GFA Basic Competition, *Amiga Shopper*, 29 Monmouth Street, Bath BA1 2DL.

Your entry must reach us by December 7. The usual competition small print applies; the editor's decision is final.

THE QUESTIONS

1) What does Basic stand for?
2) Name one other computer that GFA Basic is available for.
3) Which is faster, an interpreted Basic program or a compiled one?

Easy, eh? So get your entry in the post right away and you could get a copy of GFA Basic.

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6. Rate out of ten this and any other computer magazines you read regularly:
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WINNERS

In our September competition we had a flood of entries after a copy of *Superbase Professional 4*. The answers to the questions were: a) Andrew Lloyd Webber wrote *Jesus Christ, Superstar*, b) Shirley Conran wrote *Superwoman*; c) a supernova is an expoloding star and d) all of the above.

Receiving a copy of *Superbase Professional 4* from Precision are: Mrs Rhoda Sansom, Alfreton, Derbyshire; Nicholas Milner, Malton, North Yorkshire; Gary Stimson, Roade Northants; P H Bevan, Newbury, Berks; and Paul Bradshaw, Warrington, Cheshire.

In October the competition switched to *Pen Pal* from Gordon Harwood and a number of quotes. An extraordinary number of people got the answers completely wrong. They right ones are: a) "This is the way the world ends, not with a bang but a whimper" - T S Elliott; b) "To love oneself is the beginning of a life-long romance" - Oscar Wilde; c) "We are just statistics, born to consume resources" - Horace; d) "God is subtle but he is not malicious" - Albert Einstein.

The 20 winners of *Pen Pal* are:

G Fairclough, London E2; M Jackson, Rotherham, South Yorks ; C Caple, Newquay, Cornwall; C Cotton, Oadby, Leicester; C Millar, Dumfries; P Marsh, Stockport, Cheshire; D Woolnough, Beccles, Suffolk; D Goodall, Sunderland; J Pelly, Haverhill, Suffolk; J McGeough, Coatbridge, Strathclyde; N Culpin, Stalybridge, Cheshire; R Dawson, Southport, Merseyside; D Thorogood, Dagenham, Essex; D Blake, Banbury, Oxfordshire; J Barber, South Nutfield, Surrey; M Davidson, Larkhall, Lanarkshire; A Ellis, Weybridge, Surrey; D Piper, Hemel Hempstead, Herts; I Thomson, Balmedie, Aberdeen; D Lawton, Crewe, Cheshire.

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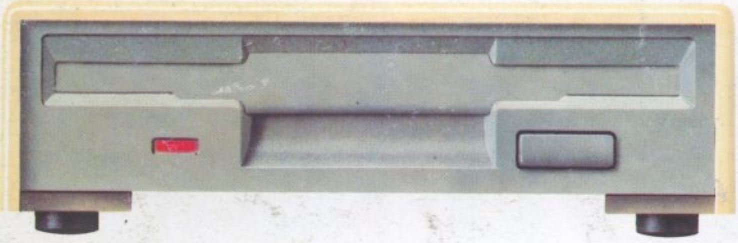
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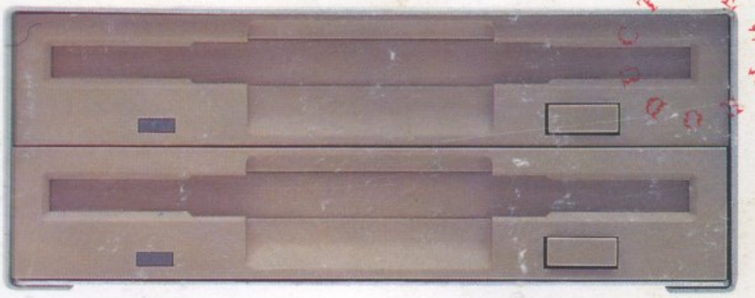
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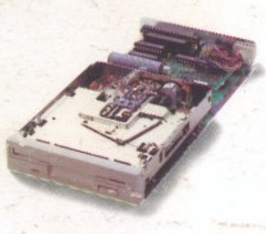
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